



# **WATER METER & BACKFLOW PREVENTION DEVICE DESIGN & INSTALLATION MANUAL**

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## **1.0 INTRODUCTION**

This *HRWC Water Meter & Backflow Prevention Device Design & Installation Manual* outlines the design and installation requirements for water meters and backflow prevention devices connected to the HRWC Water System.

The manual is broken into three sections, Design, Application and Installation. This manual is intended to be used in conjunction with the *HRWC Design Specification* and the *HRWC Supplementary Standard Specification*. HRWC recognized professionals designing inside the building envelope are not necessarily the same as those designing public infrastructure. This manual reflects that philosophy, making it easier for designers, contractors and the HRWC.

The HRWC Regulations state all Water Service Connections to the HRWC Water System are required to be metered. For new connections, the installation of a water meter is triggered by a *Halifax Regional Municipality Building Permit Application*, or a *HRWC New Service & Renewal Application* for existing buildings. The requirement for a water meter applies to:

- New Water Service Connections for new building construction
- New Water Service Connections for an existing building
- Temporary Water Service Connections for buildings under construction
- Change in water meter size
- Temporary Water Service Connections for events
- Seasonal Water Service Connections

The HRWC Regulations state where, in the opinion of the HRWC, there may exist a risk of contamination to the Water System, the HRWC may require a Customer, at the Customer's sole cost and expense, to install at any point on the Customer's Water Service Connection, Sprinkler Service Connection, or water service pipe, one or more backflow prevention devices, which devices shall be of a quality and type approved by the HRWC.

The Cross Connection Control Program utilizes premise isolation to minimize the risk of contaminants entering the Water System from the premises through backflow. Backflow can occur if water is siphoned from premises due to a reduction in pressure in the distribution system or as a result of pressurized equipment being used on the premise.

This document is not intended to eliminate the necessity for detailed design; rather it is intended to standardize the materials, design criteria and method of construction to be utilized in the installation of water meters and backflow prevention devices. Further, it is not the intention of the HRWC to stifle innovation. Where, in the judgment of the Design Engineer, variations from this document are justified or required, and where the Design Engineer can show that alternate approaches can produce the desired results, such

approaches will be considered for approval. In considering requests for variations from these design criteria, the Engineer will take into consideration such factors as safety, nuisance, system maintenance, operational costs, life cycle costs, environmental issues, natural topography, and configuration of the bulk land. Where the Design Engineer uses standards other than those outlined in this document, all appropriate documents and plans are to indicate the standards referenced. The acceptance by the Engineer of the design of proposed water meter and backflow prevention device arrangements does not relieve the Design Engineer of the responsibility of proper design nor does it imply the Engineer has checked the design exhaustively for compliance with this document. Where the Engineer has accepted a design which does not comply with this manual and where the Design Engineer has not brought variations from this document to the attention of the Engineer, the provisions of this document still stand.

In addition to these design specifications, all applicable and relevant codes and standards to be used by the Design Engineer, include, but not limited, to the following:

- American Society for Testing and Materials (ASTM)
- American Water Works Association (AWWA)
- Atlantic Canada Water Works Association (ACWWA)
- Building Code Act of Nova Scotia
- Canadian Standards Association (CSA)
- Ductile Iron Pipe Research Association (DIPRA)
- Fire Safety Act of Nova Scotia
- Hydraulic Institute Standards
- Insurers Advisory Organization
- National Building Code of Canada
- National Fire Protection Association
- National Plumbing Code of Canada
- National Sanitation Federation (NSF)
- Underwriters Laboratories of Canada

The design, installation and testing specifications in this document will be revised periodically to conform to advances and improvement in the practice of engineering. It is the responsibility of the Design Engineer to remain current with revisions to this document.

**All piping, valves, fittings, couplings, water meters and backflow prevention devices contained within the water meter and backflow prevention device arrangements are required to be in compliance with NSF-61.**

## 2.0 DEFINITIONS

<b>Approval</b>	Refers to the approval of the Engineer. The Engineer's decision will be final and binding in matters of design, installation, inspection and acceptance.
<b>Applicant</b>	A person or company that makes application to extend, or connect to, the HRWC Systems.
<b>Contractor</b>	Any person who, for another person, carries out work or supplies labour for the alteration, construction, demolition, excavation, or development of land or a structure.
<b>Customer</b>	A person who arranges to be or is supplied with water and/or Wastewater Service at a specified location or locations and includes a person receiving Stormwater Service.
<b>Design Engineer</b>	A person who practices professional engineering and is a registered member, in good standing, of Engineers Nova Scotia. Referenced in this document, as the Professional Engineer under whose signature the engineering design is sealed.
<b>Development</b>	Includes any erection, construction, addition, alteration, replacement or relocation of or to any building or structure and any change or alteration in the use of land, buildings or structures.
<b>Diameter</b>	The nominal internal diameter of the pipe – unless otherwise noted.
<b>Domestic</b>	Any residential, industrial, commercial and institutional non-fire water use.
<b>Engineer</b>	The Director of Regulatory Services of the HRWC, or their designated representative.



**Hazard**

Minor Hazard – any type of cross-connection or potential cross-connection that involves a substance that constitutes only a nuisance and that results in a reduction in only the aesthetic qualities of the water. This category includes atmospheric or pressure connections involving water that might have been heated or cooled and connections that cannot create a danger to health.

Moderate Hazard – any minor hazard connection that has a low probability of becoming a severe hazard. This category includes, but not limited to, connections involving water where the aesthetic qualities of the water have been reduced and, under certain conditions, can create a health danger.

Severe Hazard – any atmospheric or pressure type cross-connection or potential cross-connection involving water that has additives or substances that, under any concentration, can create a danger to health.

**Halifax Regional Municipality**

Halifax Regional Municipality, a body corporate, as established under the *Municipal Government Act*, 1998, c. 18, s.1.

**HRWC**

Halifax Regional Water Commission, a body corporate, as established under the *Halifax Regional Water Commission Act*, 2007, c. 55, s. 2; 2012, c. 60, s.1., is the municipal water, wastewater and stormwater utility for Halifax Regional Municipality. The HRWC is authorized to own and operate the water supply, wastewater and stormwater facilities for Halifax Regional Municipality.

**HRWC Regulations**

HRWC's *Schedule of Rates, Rules and Regulations for Water, Wastewater and Stormwater Services*, as amended from time to time by the Nova Scotia Utility and Review Board.

**HRWC Systems**

The collective HRWC Water, Wastewater and Stormwater Systems.

**Industrial, Commercial or Institutional**

includes or pertains to industry, manufacturing, commerce trade, business, or institutions and includes multi-unit residential dwellings of four or more units.

**Multi-Unit Residential**

A building which contains four or more residential dwelling units.

<b>Primary Services</b>	Means those services which must be installed and accepted by the authority having jurisdiction prior to accepting a public street or highway and include park dedication, Water System, Wastewater System and Stormwater System, street construction including all gravel layers and base lift of asphaltic concrete or Portland cement concrete pavement including curb and gutter backfilled, permanent stabilization of all exposed areas, driveways, guiderails, electrical and communication distribution system including underground conduit, street name signs and sign base and standards, and street lighting system.
<b>Professional Engineer</b>	A person who practices professional engineering and is a registered member, in good standing, of Engineers Nova Scotia. Referenced in this document for the purposes of inspection and acceptance of HRWC Systems and may, but not necessarily be the Design Engineer whose signature the engineering design are sealed.
<b>Sprinkler Service Connection</b>	A piping system that conveys water from a water main to a property for the sole purpose of providing fire protection.
<b>Subdivision</b>	The division of any area of land into two or more parcels, which may include a re-subdivision or a consolidation of two or more parcels.
<b>Water Service Connection</b>	A piping system that conveys domestic water from a water main to a property.
<b>Water System</b>	The source, structures, pipes, hydrants, meters, devices and related equipment used, or intended to be used, for the collection, transportation, pumping or treatment of water, and which are vested in or under the control of HRWC.



### 3.0 WATER METER & BACKFLOW PREVENTION DESIGN

It is intended this section be used in conjunction with the requirements of the *HRWC Design Specification*. The *HRWC Design Specification* details the requirements for Water Service Connections and Sprinkler Service Connections.

**All piping, valves, fittings, couplings, water meters and backflow prevention devices contained within the water meter and backflow prevention device arrangements are required to be in compliance with NSF-61.**

#### 3.1 WATER METER DESIGN

For all Water Service Connections, the Applicant is responsible to supply and install all piping, fittings, chambers and equipment necessary to construct the water meter arrangement. HRWC will supply, own, operate and maintain the water meter.

One water meter is to be supplied per Water Service Connection unless otherwise approved. An example of an exception would be a property with multiple buildings where subdivision of the property is foreseen and multiple Water Service Connection installations have been approved.

Water meters are only installed once all requirements of the *HRWC Design Specification*, *HRWC Supplementary Standard Specification* and *HRWC Water Meter & Backflow Prevention Device Design & Installation Manual* are met, along with the acceptance of Primary Services for new subdivisions by Halifax Regional Municipality.

Sprinkler Service Connections must be equipped with a backflow prevention device equipped with bypass metering technology to detect leakage or unauthorized use of water. The 16 mm (5/8") bypass water meter will be supplied and installed by HRWC.

##### 3.1.1 Water Meter Sizing

All water meters for single-unit dwellings are sized at 16 mm (5/8"). In cases where the Design Engineer can demonstrate the need for a larger water meter, the water meter is to be sized in accordance to *AWWA M22 Sizing Water Service Lines and Meters* and the *Water Meter Sizing Calculation Sheet* found in **Appendix A**. The calculation sheet must be submitted when requesting meters greater than 16 mm (5/8") with the *Halifax Regional Municipality Building Permit Application* or the *HRWC New Service & Renewal Application*.

The Total Peak Demand for a water meter cannot exceed 90% of the maximum instantaneous flow as specified by the water meter manufacturer, with a maximum pressure loss of 48 kPa (7 psi) at the design flow rate. The size selection cannot compromise the operating range or operating life of the water meter and the flow supplied to the premise are appropriate for the intended use.

It is expected that in most cases the water meter size will be at least one or two sizes smaller than the Water Service Connection, providing they meet the size selection criteria. The Design Engineer must confirm the meter selection and installation requirements are appropriate for the designed premise land use.

### **3.1.2 Water Meter Selection**

Water Meters are supplied and installed by HRWC:

**Table 3.1 – Water Meters**

<b>Meter Size (Metric)</b>	<b>Meter Size (Imperial)</b>	<b>Neptune Model</b>	<b>90% Max Inst. Flow (usgpm)</b>	<b>Maximum Instantaneous Flow (usgpm)</b>
16 mm	5/8"	T-10 Positive Displacement	18	20
19 mm	3/4"	T-10 Positive Displacement	27	30
25 mm	1"	T-10 Positive Displacement	45	50
38 mm	1.5"	T-10 Positive Displacement	90	100
50 mm	2"	T-10 Positive Displacement	144	160
75 mm	3"	Tru/Flo Compound Water Meter	315	350
100 mm	4"	Tru/Flo Compound Water Meter	540	600
150 mm	6"	Tru/Flo Compound Water Meter	1215	1350
150 mm	6"	HP Potectus III S Fire Service Meter	2790	3100
200 mm	8"	HP Potectus III S Fire Service Meter	4500	5000
250 mm	10"	HP Potectus III S Fire Service Meter	7200	8000

Unless otherwise approved a separate Sprinkler Service Connection must be supplied to each property which utilizes fire sprinklers or onsite private fire hydrants. The Sprinkler Service Connection must be equipped with a backflow prevention device equipped with bypass metering technology to detect leakage or unauthorized use of water. The 16 mm (5/8") bypass water meter will be supplied and installed by HRWC.

All other uses that require service from the potable water system (including domestic, process, and irrigation) must be serviced from the domestic service line with tees and branches located after the water meter.

### 3.1.3 Water Meter Location

Water meters are to be located within the building to which water service is being provided. General requirements for locating the water main within the building are:

- Within a heated space, protected from freezing temperatures
- Provide a minimum of 750 mm (30") in front of the water meter and 300 mm (12") behind to be free of obstruction to allow for convenient maintenance and testing of the meter at all times
- Water meter to be installed within 1200 mm (48") of where the service connection enters the building
- Minimum of 300 mm (12") above the floor to centreline of pipe
- Maximum of 750 mm (30") above the floor to centreline of pipe
- No electronic, mechanical and water sensitive equipment or machinery should be placed or installed under or over the water meter arrangement or in an area where splash or flow from the meter settings or pipes could occur during the servicing of the meter
- Water meters are not to be installed in a bathroom or a garage
- Recommend to be placed in close proximity to a floor drain, sized and positioned, to accept flows

Water Service Connections greater than 50 metres (164 feet) in length from the street right-of-way boundary may require the water meter to be located in a meter chamber on private property adjacent to the street right-of-way, at the discretion of the Engineer. Refer to the *HRWC Design Specification* and the *HRWC Supplementary Standard Specification* for design and installation in relation to Water Service Connections or water meter chambers.

### 3.1.4 Water Meter Arrangement

The general configurations for water meter installations are illustrated in **Appendix B**. The water meter arrangement is to be horizontally level, with register casing facing upward and plumb.

For water meters 75 mm (3") and greater provide straight lengths of pipe (length equal to or greater than five times the diameter of the pipe) upstream and downstream of the water meter. Isolation shutoff valves are not permitted to be directly attached to the water meter, but may be located within the straight length distance in accordance with the manufacturer's specification. A restrained coupling must be provided on the upstream side of the water meter for flexibility in case of water meter removal.

#### **3.1.4.1 Piping Material**

Piping material of the water meter and backflow prevention device arrangement is to be type k copper tubing to ASTM B88 or ductile iron, special class 52/54 to AWWA C151. This must include a straight length of 1200 mm (48") beyond the water meter.

For PEXa Water Service Connections transition to copper tubing using ASTM 2080 Compression Sleeve Fitting after entering the building and prior to the beginning of the arrangement.

#### **3.1.4.2 Isolation Valves**

Isolation shutoff valves are required to be installed upstream and downstream of the water meter arrangement. Isolation shutoff valves are not permitted to be directly attached to the water meter. All shutoff valves are ball valve type for copper tubing water meter arrangements, with the exception of the lockable gate valve for a bypass assembly. For ductile iron water meter arrangements, the type of valve is dependent on the diameter of the pipe. Consult Section 5.0 for valve specifications.

Provide isolations valves as indicated in the Supplementary Standard Details or as directed by the Engineer.

#### **3.1.4.3 Strainers**

Locate strainers upstream of the water meter and pressure reducing valve.

#### **3.1.4.4 Pressure Reducing Valves**

##### Residential

Locate pressure reducing valves upstream of the water meter and downstream of water meter valve or shutoff valve #1 and the strainer (if installed).

Pressure reducing valves are required when the water pressure entering the premise is calculated to be 550 kPa (80 psi) or greater.

### Multi-Unit, Industrial, Commercial & Institutional

It is the responsibility of the Design Engineer to account for the pressure in the Water System in the design water meter and backflow prevention device arrangement.

#### **3.1.4.5 Water Booster Pumps**

Locate water booster pump downstream of the water meter and backflow prevention device. The backflow prevention device must be a stand-alone device. A backflow prevention device integrated within the booster pump will not be considered as satisfying the backflow prevention device requirement.

Water booster pumps are recommended when the water pressure entering the premise is calculated to be 275 kPa (40 psi) or less. The booster pump will be installed within a by-pass arrangement.

#### **3.1.4.6 Bypass Arrangements**

A locking bypass is required to be installed on all arrangements with water meters 75 mm (3") and larger. The bypass arrangement piping is to be the same diameter as the water meter arrangement.

Installations requiring a 50 mm (2") water meter will be issued a T-10 positive displacement water meter. Should the Applicant request the installation of a 50 mm (2") Tru/Flo compound water meter, a locking bypass arrangement, with backflow prevention, is required. This request will be evaluated on a case by case basis and is at the discretion of the Engineer.

After water meter installation, the lockable bypass gate valve will be locked and sealed by the HRWC.

#### **3.1.4.7 Remote Registers**

Provide a 12 mm (1/2") conduit from the water meter location to the exterior of the building for the purpose of installing an outside register.

Exterior location is to have easy access, driveway area preferred, located approximately 1200 mm (48") above grade (ground) and easily accessible for reading. Remote registers are not to be located within locked fenced areas. Where possible these should be located adjacent to gas or electric meters.

### **3.1.4.8 Water Meter Chambers**

Water meter chambers must meet the requirements of the *HRWC Design Specification* and *HRWC Supplementary Standard Specification*, and be selected to provide adequate space for removal and testing of all equipment within the meter.

Thrust beams must be designed for all chambers housing equipment 75 mm (3") or larger to ensure that the force caused by a closed valve is transferred to the full width of the chamber. The Design Engineer shall ensure that the chamber manufacturer is in agreement with the thrust bearing area on the chamber.

All chambers for non-positive displacement meters must be equipped with a sump and drained by either a gravity connection to the storm sewer or where this is not possible by an electric sump pump. The Applicant is responsible for providing power to the sump pump in accordance with the *Building Code Act of Nova Scotia*.

## **3.2 BACKFLOW PREVENTION DEVICE DESIGN**

For all Water Service Connections and Sprinkler Service Connections, the Applicant is responsible to supply and install all backflow prevention devices, piping, fittings, chambers and equipment necessary to construct the backflow prevention device arrangement.

All backflow prevention arrangement design and device selection is required to meet the CSA B64.10 and B64.10.1 standard unless otherwise directed by this manual.

### **3.2.1 Backflow Prevention Device Premise**

Backflow prevention devices are required to be installed on all new Water Service Connections and Sprinkler Service Connections supplying:

- Multi-unit residential
- Industrial
- Commercial
- Institutional
- Premises served by private booster pumps
- Premises supplied by small HRWC owned Water Systems (minor hazard)



A change of use of a premise, where in the opinion of the Engineer there may exist a risk of contamination to the Water System, the Applicant is required to install a backflow prevention device on the Water Service Connection. This backflow prevention device requirement also applies to premises undergoing a renovation or alteration.

### **3.2.3 Backflow Prevention Device Sizing**

To avoid excessive pressure loss, backflow prevention devices are to be sized in conjunction with the water meter sizing and the manufacturer's specification.

### **3.2.4 Backflow Prevention Device Selection**

Refer to CSA B64.10 / B64.10.1 Table B.2 *Guide to Degree of Hazard – Premise* to evaluate the degree of hazard for the specific premise.

- Minor Hazard              Dual Check Valve (DuC)
- Moderate Hazard        Double Check Valve Assembly (DCVA)
- Severe Hazard            Reduced Pressure Principle (RP)

Sprinkler Service Connections must be equipped with a backflow prevention device equipped with bypass metering technology to detect leakage or unauthorized use of water. The 16 mm (5/8") bypass water meter will be supplied and installed by HRWC.

### **3.2.5 Backflow Prevention Device Location**

Backflow prevention devices must be installed downstream of the water meter and isolated with shutoff valves.

**Table 3.2 – Clearances (Metric)**

Type of Device	Above floor to centreline		Clearances around the device for access			
	Minimum mm	Maximum mm	Below mm	Above mm	In front mm	Behind mm
DuC	300	750			750	25
DCVA	750	1500		300	750	25
RP	750	1500	300	300	750	25

**Table 3.3 – Clearances (Imperial)**

Type of Device	Above floor to centreline		Clearances around the device for access			
	Minimum inches	Maximum inches	Below inches	Above inches	In front inches	Behind inches
DuC	12	30			30	1
DCVA	30	60		12	30	1
RP	30	60	12	12	30	1

### **3.2.6 Floor Drain**

A backflow prevention devices can discharge a significant volume of water should the device fail during a backflow condition. Backflow prevention device arrangements are to have a floor drain sized and positioned to accept the flows.

Calculations in support of the sizing of the floor drain are required to be submitted with the Application.

### **3.2.7 Backflow Prevention Device Arrangement**

The general configurations for backflow prevention device installations are illustrated in the Supplementary Standard Details in **Appendix B**.

Backflow prevention devices must be horizontally level and downstream of the water meter.

#### **3.2.7.1 Bypass Arrangements**

A second backflow prevention device is required on the parallel bypass line.

#### **3.2.7.2 Water Meter Chambers**

Reduced pressure principle backflow prevention devices are not permitted to be installed within below grade meter chambers.

Refer to the *HRWC Design Specification* for water meter chamber requirements.

### 3.2.7.3 Private Fire Hydrants on Sprinkler Service Connections

All on-site private fire hydrants must be located after the site premise back flow prevention device.

### 3.2.7.4 Fire Pumps on Sprinkler Service Connections

It is the intention of this *HRWC Water Meter & Backflow Prevention Device Design & Installation Manual* to be used in conjunction with National Fire Protection Association standards, specifically:

- NFPA 13 (2016) – *Standard for the Installation of Sprinkler Systems*
- NFPA 20 (2016) – *Standard for the Installation of Stationary Pumps for Fire Protection*

Where a pump is installed on a fire protection system, the backflow prevention device is to be installed downstream of the pump. To obtain approval where the backflow prevention device is upstream of the fire pump, a hydraulic analysis must be submitted under the seal of the Design Engineer. Reduced Pressure Principle (RP) backflow prevention devices are not allowed upstream of the fire pumps under any circumstances.

The National Fire Protection Association (NFPA) states in NFPA 20, section 4.28.3 “*Devices in Suction Piping. Where located in the suction pipe of the pump, check valves and backflow prevention devices or assemblies shall be located a minimum of 10 pipe diameters from the pump suction flange.*”

### 3.2.8 Backflow Prevention Device Tester's License

The HRWC Regulations directs the HRWC to maintain a Cross Connection Control program for the issuance, renewal and cancellation of Backflow Prevention Device Tester's Licenses, which shall include minimum standards, insurance requirements, fees and administrative procedures.

Backflow Prevention Device Tester's Licenses are divided into two categories. Type A – General Testers are issued to those qualified to install, maintain and test backflow prevention devices. Type B – Limited Testers are issued to those qualified to test backflow prevention devices.

Type A – General Testers qualifications:

- *Cross Connection Control Tester Certificate* issued by the ACWWA
- *Sprinkler Systems and Plumbing Certificate*
- *Certificate of Liability Insurance* for \$1,000,000 (minimum)
- *Cross Connection Control Accuracy Verification Report*
- License fee of \$50.00

Type B – Limited Testers qualifications:

- *Cross Connection Control Tester Certificate* issued by the ACWWA
- *Certificate of Liability Insurance* for \$1,000,000 (minimum)
- *Cross Connection Control Accuracy Verification Report*
- License fee of \$50.00

Licenses are valid for one year. The *Backflow Prevention Device Tester's Licenses Application* and the *Cross Connection Control Accuracy Verification Report* can be downloaded from the HRWC website, and are found in **Appendix C** of this manual.

### 3.2.9 Backflow Prevention Device Testing

All backflow prevention devices installed must be maintained, in good working order, inspected and tested by a qualified individual who holds a *HRWC Backflow Prevention Device Tester's License*, at the expense of the Customer.

Backflow prevention devices require testing upon installation and on an annual basis. The Customer must submit the inspection report within 30 days of a test. A notice will be sent to the property owner, by the HRWC, thirty (30) days prior to the anniversary date of the installation of the backflow prevention device.

## **4.0 WATER METER & BACKFLOW PREVENTION APPLICATION**

This section outlines the applications that are related to installing a water meter or backflow prevention device on a Water Service Connection connected to the HRWC Water System. The HRWC applications can be downloaded from the HRWC website, and are found in **Appendix C** of this manual.

### **4.1 Halifax Regional Municipality Building Permit Application**

When constructing new building within the water service boundary in Halifax Regional Municipality, the application is distributed to HRWC for review and approval. Letters from HRWC are sent directly to the Applicant.

The application requirements are indicated in the *HRWC Design Specification*.

### **4.2 New Service & Renewal Application**

When a building exists and fronts on a Halifax Regional Municipality street right-of-way or public easement which contains a water main, the Applicant can make application to connect, or renew the service connection to the HRWC Water System using a *New Service & Renewal Application* directly to the HRWC.

The application requirements are indicated in the *HRWC Design Specification*.

New seasonal connections requests are to the HRWC Systems are to use this Application.

### 4.3 Water Service Connection, Water Meter & BFP Device Application

Multi-unit, Industrial, Commercial and Institutional buildings making application either via the *Halifax Regional Municipality Building Permit Application* or a *New Service & Renewal Application* for domestic Water Service Connection are required to complete a *Water Service Connection, Water Meter & Backflow Prevention Device Application* and a *Water Meter Sizing Calculation Sheet*. **Appendix A** steps the Applicant through the water meter sizing calculation.

Servicing Plan / Water Meter & Backflow Prevention / Calculation Drawing (template in **Appendix A**):

- a. The template for this single plan can be found in the HRWC Water Meter & Backflow Prevention Device Design & Installation Manual.
- b. **Servicing Plan Quadrant.** Detail the proposed Water, Wastewater and Stormwater Service Connections to be installed, show:
  - street right-of-way containing the mains, sizes and material.
  - natural gas, power, electrical conduits, transformers.
  - communications, fuel tanks, and other structures.
  - all surface classifications (undisturbed natural areas, building foot print, landscaped, graveled, concrete paved and asphalt paved areas) measured areas (m<sup>2</sup>) that are applicable to the proposed project. This information is to be provided for in tabular form and indicated on the plan.
  - square footage of industrial, commercial and institutional building space. Number of residential multi-units.
  - Irrigation systems
- c. **Profile Quadrant.** A profile perspective drawing of the water meter and backflow prevention device arrangement, all components, sizing and materials are to be clearly identified, in the profile quadrant.
- d. **Plan Quadrant.** Detail a plan perspective drawing of the water meter and backflow prevention device arrangement, all components, sizing and materials are to be clearly identified, in the plan quadrant. Drains.
- e. **Calculation Quadrant.** Detail exactly the two page Water Meter Sizing Calculation Sheet in the water meter sizing quadrant. Drain calculations.
- f. Provide two copies of this drawing. The record drawing for the Service Connection will be presented in the same format.



#### **4.4 Sprinkler Service Connection & BFP Device Application**

Multi-unit, Industrial, Commercial and Institutional buildings making application either via the *Halifax Regional Municipality Building Permit Application* or a *New Service & Renewal Application* for Sprinkler Service Connection for fire protection are required to complete a *Sprinkler Service Connection & Backflow Prevention Device Application*.

A plan and profile drawing must be submitted with this application. The drawings must be accompanied by a site plan that includes items listed in 4.3 as well as:

- Onsite fire system (hydrants, fire sprinklers)

#### **4.5 Change In Water Meter Size Application**

If a Customer requires a change in water meter size, a *Change In Water Meter Size Application* is to be submitted to the HRWC along with a *Water Meter Sizing Calculation Sheet*.

#### 4.6 Temporary Water Meter Application

For multi-unit, industrial, commercial and institutional buildings under construction, the Applicant has the ability to apply for a temporary 16 mm (5/8") water meter. It may be necessary to adjust the water meter arrangement to accommodate the temporary water meter. Requirements for a temporary water meter are the same as the requirements for the permanent water meter as outlined in the *HRWC Design Specification*, with the exception of the Service Connection Record Drawings and the Engineer's Certificate of Compliance are submitted at building's substantial completion of construction. The following must be submitted and approved by HRWC for a temporary water meter.

- .1 Records of acceptable water service connection hydrostatic tests.
- .2 Records of acceptable bacteriological examination results.
- .3 Closed Circuit Television (CCTV) inspection and report. Refer to the *HRWC Supplementary Standard Specification* for CCTV requirements.
- .4 Final inspection of the Water, Wastewater and Stormwater Service Connection(s) by HRWC.
- .5 New Service Connection cards.
- .6 Approval and inspection of the backflow prevention device(s) by Cross Connection Control Technologist.

A temporary water meter is permitted for a **maximum of 6 months**. The Applicant is required to submit all outstanding Building Service Connection Acceptance Requirements at substantial completion of the building construction. Once approved, the premise owner is to schedule the permanent water meter installation. Changing the permanent meter size requires a *Change of Water Meter Size Application* and a *Water Meter Sizing Calculation Sheet*. In new subdivisions, temporary meters will not be issued until the Primary Services have been accepted by Halifax Regional Municipality.

An Applicant going beyond the 6 month period is at risk of having the water shut off.

## 5.0 WATER METER & BACKFLOW PREVENTION INSTALLATION

It is intended this section be used in conjunction with the requirements of the *HRWC Supplementary Standard Specification*.

The water meter arrangement installation is required to meet this manual and the AWWA *M22 Sizing Water Service Lines and Meters* manual.

Backflow prevention arrangement and device installation are required to meet this manual and the CSA B64.10 and B64.10.1 standard unless otherwise directed by this manual.

**All piping, valves, fittings, couplings, water meters and backflow prevention devices contained within the water meter and backflow prevention device arrangements are required to be in compliance with NSF-61.**

### 5.1 REFERENCE STANDARDS

.1	ASME B16.1-2015	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, and 250.
.2	ASSE 1060-2017	Performance Requirements for Outdoor Enclosures for Fluid Conveying Components.
.3	ASTM A36/A36M-14	Standard Specification for Carbon Structural Steel.
.4	ASTM A183-14	Standard Specification for Carbon Steel Track Bolts and Nuts.
.5	ASTM A240/A240M-16a	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
.6	ASTM A276/A276M-17	Standard Specification for Stainless Steel Bars and Shapes.
.7	ASTM A283/A283M-13	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.

.8	ASTM A536-84(2014)	Standard Specifications for Ductile Iron Castings.
.9	ASTM B62-17	Standard Specification for Composition Bronze or Ounce Metal Castings.
.10	ASTM B88M-16	Standard Specification for Seamless Copper Water Tube (Metric).
.11	ASTM B584-14	Standard Specification for Copper Alloy Sand Castings for General Applications.
.12	ASTM F2080-16	Standard Specification for Cold-Expansion Fittings with Metal Compression-Sleeves for Crosslinked Polyethylene (PEX) Pipe and SDR9 Polyethylene of Raised Temperature (PE-RT) Pipe
.13	AWWA C104/A21.4-16	Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water.
.14	AWWA C110/A21.10-12	Ductile-Iron and Gray-Iron Fittings.
.15	AWWA C111/A21.10-12	Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
.16	AWWA C115/A21.15-11	Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges.
.17	AWWA C151/A21.51-17	Ductile-Iron Pipe, Centrifugally Cast, for Water.

.18	AWWA C153/A21.53-11	Ductile-Iron Compact Fittings.
.19	AWWA C220-12	Stainless Steel Pipe 1/2 In. (13 mm) & Larger.
.20	AWWA C223-13	Standard for Fabricated Steel and Stainless Steel Tapping Sleeves.
.21	AWWA C500-09	Metal-Seated Gate Valves for Water Supply Service.
.22	AWWA C502-14	Dry-Barrel Fire Hydrants.
.23	AWWA C504-15	Rubber-Seated Butterfly Valves.
.24	AWWA C509-15	Resilient-Seated Gate Valves for Water-Supply Service.
.25	AWWA C510-07	Double Check Valve Backflow Prevention Assembly.
.26	AWWA C511-07	Reduced-Pressure Principle Backflow-Prevention Assembly.
.27	AWWA C512-15	Air Release, Air/Vacuum, and Combination Air Valves for Waterwork and Wastewater Service.
.28	AWWA C515-15	Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
.29	AWWA C600-10	Installation of Ductile-Iron Water Mains and Their Appurtenances.
.30	AWWA C605-13	Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
.31	AWWA C606-15	Grooved and Shoulder Joints.
.32	AWWA C800-14	Underground Service Line Valves and Fittings.

.33	AWWA C900-16	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1,500 mm).
.34	AWWA C904-16	Cross-Linked Polyethylene (PEX) Pressure Pipe, 1/2 In. (13mm) Through 3 In. (76 mm), for Water Service.
.36	AWWA C906-15	Polyethylene (PE) Pressure Pipe and Fittings, 4 In. thru 65 In. (100 mm Through 1650 mm), for Waterworks.
.37	AWWA M22	Sizing Water Service Lines and Meters
.38	AWWA M41	Ductile-Iron Pipe and Fittings
.39	CSA B64.10-17/B64.10.1-17	Selection and Installation of Backflow Preventers/Maintenance and Field Testing of Backflow Preventers.
.40	CSA B137.5-17	Crosslinked polyethylene (PEX) tubing systems for pressure applications.
.41	NFPA (Fire) 13 - 2016	Standard for the Installation of Sprinkler Systems
.42	NFPA (Fire) 20 - 2016	Standard for the Installation of Stationary Pumps for Fire Protection
.43	NSF 61-2016	Drinking Water System Components - Health Effects (Includes Amendment).



## **5.2 PRODUCTS**

### **5.2.1 Pipe**

- .1 Ductile iron, special class 52 to AWWA C151/A21.51.
- .2 Ductile iron, special class 54 to AWWA C151/A21.51.
- .3 Copper tubing: to ASTM B88M, Type K annealed, minimum pressure rating of 1035 kPa.

### **5.2.2 Joints**

- .1 Push-on to AWWA C111/A21.10.
- .2 Mechanical to AWWA C111/A21.10.
- .3 Flanged to AWWA C110/A21.10 or AWWA C153/A21.53.
- .4 Copper piping underground: AWWA C800 compression joint brass valves and fittings for underground connections. Minimum pressure rating 1035 kPa.
- .5 Copper piping Interior: Lead free soldered joints. One lead free soldered joint is permitted upstream of the water meter.

### **5.2.3 Fittings**

- .1 Full body to AWWA C110/A21.10.
- .2 Compact to AWWA C153/A21.53.
- .3 Where PEXa is the Water Service Connection material the transition to the copper tubing arrangement use ASTM F2080 compression sleeve fitting for transition to the copper tubing of the water meter arrangement.
- .4 Water meters 25mm (1”) and smaller are threaded and require female threaded adapters. Male couplings are supplied and installed by HRWC during the water meter installation.

### **5.2.4 Ductile Pipe Coatings**

- .1 Interior: cement mortar lining with asphaltic seal coat to AWWA C104/A21.4.
- .2 Exterior: asphaltic seal coat to AWWA C151/A21.51.

### **5.2.5 Valves**

- .1 Shutoff valves: to AWWA C800 up to 50 mm (2") with have bronze case with National Pipe Threaded (NPT), soldered, compression type or flange connections except for lockable bypass valves,
  - .1 Shutoff valves may be ball or cylinder corporation style using rubber o-ring seals. Actuation is to be by a curb-stop-style operating nut. All bypass valves must have a lock wing on the operating nut and the case.
  - .2 All bypass gate valves must be brass or stainless steel (chamber) with locking lever.
- .2 Gate valve: to AWWA C509 and AWWA C515 75 mm (3") to 300 mm (12") minimum design working pressure of 1380 kPa as follows:
  - .1 Body: cast iron (AWWA C509) / ductile iron (AWWA C515) with Class 125 flanged ends to ASME B16.1.
  - .2 Mechanism: solid resilient wedge gates, O.S. & Y., rising stem, and hand wheel.
  - .3 Direction to close: clockwise.
  - .4 Acceptable products to AWWA C509:
    - .1 Clow/Kennedy 8068A resilient wedge valve.
    - .2 Mueller A-2360-6 resilient wedge valve.
  - .5 Acceptable products to AWWA C515:
    - .1 Clow/Kennedy 7068A resilient wedge valve.
    - .2 Mueller A-2361-6 resilient wedge valve.
- .3 Butterfly valve: to AWWA C504, greater than 300 mm (12"), short body, Class 150B, minimum pressure rating 1035 kPa and as follows:
  - .1 Body: cast-iron with Class 125 flanged ends to ASME B16.1.
  - .2 Mechanism: cast-iron, cast steel, alloy cast-iron or ductile-iron, type 304 stainless steel shafts to ASTM A276/A276M, rubber seated for positive shut off at minimum one (1) MPa differential pressure either direction. Provide hand wheel operator.

- .3 Direction to close: clockwise.
- .4 Acceptable products:
  - .1 Mueller Lineseal III.
  - .2 Clow M7H style 4500 and 1450.
- .5 Epoxy coat all butterfly valves with minimum 150 microns coating.
- .4 All valves on Sprinkler Service Connections must comply with NFPA and Fire Code requirements.

#### **5.2.6 Flange Adapters**

- .1 Flange adapters must conform to AWWA C219.

#### **5.2.7 Gaskets, Nuts and Bolts for Flanges**

- .1 Gaskets:
  - .1 Full face, 3.18 mm thick, red virgin rubber one piece gaskets to AWWA C115/A21.15.
- .2 Nuts & bolts:
  - .1 Bolts are to project between 5mm and 10mm beyond the nut. Bolt diameter to be within 3mm of the diameter of the hole it is to be inserted in. Stud bolts may be used when approved by the HRWC.  
  
Hexagonal head bolt and hexagonal nuts for all sizes to conform to AWWA C115/A21.15.

## 5.2.8 Water Meters

- .1 Water Meters are supplied and installed by HRWC.

**Table 5.1 – Water Meters**

Meter Size (Metric)	Meter Size (Imperial)	Neptune Model	90% Max Inst. Flow (usgpm)	Maximum Instantaneous Flow (usgpm)
16 mm	5/8"	T-10 Positive Displacement	18	20
19 mm	3/4"	T-10 Positive Displacement	27	30
25 mm	1"	T-10 Positive Displacement	45	50
38 mm	1.5"	T-10 Positive Displacement	90	100
50 mm	2"	T-10 Positive Displacement	144	160
75 mm	3"	Tru/Flo Compound Water Meter	315	350
100 mm	4"	Tru/Flo Compound Water Meter	540	600
150 mm	6"	Tru/Flo Compound Water Meter	1215	1350
150 mm	6"	HP Potectus III S Fire Service Meter	2480	3100
200 mm	8"	HP Potectus III S Fire Service Meter	2790	5000
250 mm	10"	HP Potectus III S Fire Service Meter	7200	8000

## 5.2.9 Remote Registers

- .1 Provide 22 gauge, 3 or 4 stranded, conductor wire from the water meter location, installed through the conduit, to the exterior location for the purpose of an outside register.
- .2 Building siding is to be installed prior to remote register being supplied and installed by HRWC.

## 5.2.10 Backflow Prevention Devices

- .1 Dual Check Valve to AWWA 800.
- .2 Double Check Valve Backflow Prevention Device to AWWA C510-07.
- .3 Reduced Pressure Principle Backflow Prevention Device to AWWA C511-07.

Backflow prevention devices on Sprinkler Service Connections to be UL and FM approved.

## 5.3 EXECUTION

### 5.3.1 Water Meter Arrangement Installation

The water meter arrangement must be completely installed prior to scheduling a water meter installation appointment with HRWC.

**All piping, valves, fittings, couplings, water meters and backflow prevention devices contained within the water meter and backflow prevention device arrangements are required to be in compliance with NSF-61.**

- .1 Refer to the *Supplementary Standard Details* contained in **Appendix B** of this manual for the detail corresponding to the size of water meter being installed.
- .2 Water meter arrangement to be installed within 1200 mm (48") of where the Service Connection enters the building.
- .3 Water meter arrangements not including a backflow prevention device are to be installed between 300 mm (12") and 750 mm (30") from the floor to centreline of pipe.
- .4 Water meter arrangement must be supported with pipe supports. Refer to *Supplementary Standard Details* contained in **Appendix B** of this manual.
- .5 Place the strainer and pressure reducing valve, if required, upstream of the water meter.
- .6 16 mm (5/8") to 25 mm (1") water meters. Provide shut-off valves and female adapters on both sides of the water meter. Spacing between female adapters as follows:
  - 16 mm (5/8") water meter – 305 mm (12") space.
  - 16 mm (5/8") water meter Musquodoboit – 375 mm (15") space.
  - 19 mm (3/4") water meter – 349 mm (13 3/4") space.
  - 25 mm (1") water meter – 400 mm (15 3/4") space.
- .7 38 mm (1 1/2") to 150 mm (6") water meters. Provide shut-off valves and flanges on both sides of the water meter. Spacing between flanges as follows:
  - 38 mm (1 1/2") water meter – 330 mm (13") space.
  - 50 mm (2") water meter – 432 mm (17") space.
  - 75 mm (3") water meter – 432 mm (17") space.
  - 100 mm (4") water meter – 508 mm (20") space.
  - 150 mm (6") water meter – 610 mm (24") space.

- .8 Place the backflow prevention device, if required, downstream of the water meter.
- .9 Provide a minimum of 1200 mm (48") of straight length of pipe downstream of the last shut off valve used to isolate the water meter / backflow prevention arrangement.
- .10 A by-pass arrangement is required for water meters 75 mm (3") and larger.
- .11 One lead free soldered joint is permitted upstream of the water meter.

### **5.3.2 Remote Register Installation**

- .1 Wall mounted remote registers must be located where possible near the gas or electric meter approximately 1200 mm (48") above grade and easily accessible for reading. The communication cable (wire) from the meter to the receptacle must be installed in accordance with the manufacturer's instructions and must not exceed recommended length. Cable must be run neatly in horizontal or vertical directions only, in an approved casing or duct. Buried casing/duct should be at least 600 mm (24") deep. A drilled 10 mm (3/8") diameter hole, sealed with sealing compound, at external face of the receptacle must be provided.
- .2 For water meters installed at the property line, remote register receptacles must be mounted in the meter box or chamber lid according to the manufacturer's instructions. Meter pit (chamber) mounted receptacles must be mounted to the meter box lid in a single 45 mm (1 3/4") hole. The pit mounted receptacle(s) must be provided with a minimum length of 1800 mm (72") of 22-gauge three-colour (red, green, black) wire, connected and sealed at the receptacle without terminal exposure. Remote wiring connections must either be factory or field sealed to ensure waterproof connections.

### **5.3.3 Backflow Prevention Device Installation**

Installation of backflow prevention devices is only permitted by qualified individuals holding a HRWC Backflow Prevention Device Tester's License (Type A).

**All piping, valves, fittings, couplings, water meters and backflow prevention devices contained within the water meter and backflow prevention device arrangements are required to be in compliance with NSF-61.**



- .1 Refer to the *Supplementary Standard Details* contained in **Appendix B** of this manual for the detail corresponding to the size of water meter and backflow prevention device being installed.

**Table 5.2 – Clearances (Metric)**

Type of Device	Above floor to centreline		Clearances around the device for access			
	Minimum mm	Maximum mm	Below mm	Above mm	In front mm	Behind mm
DuC	300	750			750	25
DCVA	750	1500		300	750	25
RP	750	1500	300	300	750	25

**Table 5.3 – Clearances (Imperial)**

Type of Device	Above floor to centreline		Clearances around the device for access			
	Minimum inches	Maximum inches	Below inches	Above inches	In front inches	Behind inches
DuC	12	30			30	1
DCVA	30	60		12	30	1
RP	30	60	12	12	30	1

- .2 Prior to the installation of a backflow prevention device, flush the pipeline to remove foreign material that may impede the operation of the device.
- .3 On domestic Water Service Connections, install backflow prevention device immediately downstream of the water meter. A water connection is not permitted between the water meter and backflow prevention device.
- .4 On bypass water meter arrangements, install a second backflow prevention device parallel on the bypass as indicated in the *Supplementary Standard Details*.
- .5 Where a pump is installed on a fire protection system, the backflow prevention device is to be installed downstream of the pump. To obtain approval where the backflow prevention device is upstream of the fire pump, a hydraulic analysis must be submitted under the seal of a Professional Engineer. Reduced Pressure Principle (RP) backflow prevention devices are not allowed upstream of the fire pumps under any circumstances.
- .6 Install RP backflow prevention device in horizontal orientation with valves in upright position. Double Check Valve Assemblies (DCVA) can be in a horizontal (valves in upright position) or vertical orientation.

- .7 All backflow prevention devices must be tested at the time of installation and on an annual basis thereafter, by a qualified individual who holds a HRWC Backflow Prevention Device Test's License.
- .8 Requirements for retrofitting of existing systems are the same as new construction, however, due to variable and unique conditions that may be encountered, variances from the policy on location and/or installation of backflow prevention devices will be considered. Submit an application to the HRWC.

#### **5.3.4 Backflow Prevention Device HRWC Inspection**

All backflow prevention device installations are required to be inspected and approved by HRWC prior to water meter installation.

Phone HRWC Engineering Approvals at (902) 490-6914 to schedule a backflow prevention device inspection.

#### **5.3.5 Backflow Prevention Device Testing**

Upon installation of the backflow prevention device, the device is to be tested qualified individual who holds a HRWC Backflow Prevention Device Test's License to the requirements of *B64.10.1 - Maintenance and Field Testing of Backflow Preventers*. Results are required to be submitted to HRWC within 30 days of the test.

#### **5.3.6 Water Meter Appointment**

- .1 Prior to scheduling a water meter installation appointment, the following items are required, all inspections are by HRWC:
  - .1 Installation of the Water, Wastewater and Stormwater Service Connections.
  - .2 Inspection and approval of the Water, Wastewater and Stormwater Service Connections by HRWC.
  - .3 For multi-unit residential, industrial, commercial and institutional properties, submission and acceptance of the Service Connection record information package, as detailed in Section 8.0 of the *HRWC Design Specification*.

- .4 Payment of all outstanding inspection and tapping fees.
- .5 Installation of the pressure reducing valve, if required.
- .6 Installation and inspection of the backflow prevention devices, if required.
- .7 Building to be roof tight, and all siding installed.
- .8 Curb stop and service box plumb and at grade with finished landscaping.
- .2 Where the domestic Water Service Connection is branched off of the Sprinkler Service Connection, the water meter will not be installed until the Water Service Connection, Sprinkler Service Connection and backflow prevention devices have been inspected by the HRWC.
- .3 Once the previous items have been completed, phone (902) 420-9287 to schedule a water meter installation appointment. Supply the HRWC Customer Care representative the *Halifax Regional Municipality Building Permit* number or *New Service & Renewal Application* number related to the civic address.

### **5.3.7 Water Meter Installation**

- .1 The water meter is owned, operated and maintained by the HRWC. Only HRWC can install or remove water meters.
- .2 Water meter arrangement must be installed horizontally level with the register casing plumb, facing upward.
- .3 Water meter arrangement must be checked for leakage at completion of the installation. Assembly should be flushed and air must be eliminated from the system. Run water through the meter and perform a visual check of the low-flow indicator.

#### 5.4 SUPPLEMENTARY STANDARD DETAILS

All Standard Details are in **Appendix B**. Standard details related to Service Connections are found in the *HRWC Design Specification*.

- .1 HWSD – 001 – Profile of 16 mm, 19 mm & 25 mm (5/8", 3/4" & 1") Water Meter Arrangement
- .2 HWSD – 002 – Profile of 16 mm, 19 mm & 25 mm (5/8", 3/4" & 1") Water Meter Arrangement & Backflow Prevention Device
- .3 HWSD – 003 – Profile of 38 mm & 50 mm (1-1/2" & 2") Water Meter & Backflow Prevention Device
- .4 HWSD – 004 – Profile of 75 mm (3") & Greater Water Meter with and Backflow Prevention Devices Bypass Arrangement
- .5 HWSD – 005 – Plan of 16 mm to 50 mm (5/8" to 2") Water Meter & Backflow Prevention Device Exterior Chamber Arrangement
- .6 HWSD – 006 – Plan of 75 mm (3") & Greater Water Meter & Backflow Prevention Devices with Bypass Exterior Chamber Arrangement
- .7 HWSD – 007 – Profile Master Water Meter Chamber
- .8 HWSD – 008 – Plan Master Water Meter Chamber
- .9 HWSD – 009 – Profile Residential Water Booster Pump Arrangement
- .10 HWSD – 010 – Plan of 16 mm to 50 mm (5/8" to 2") Water Meter Pit
- .11 HWSD – 011 – Pipe Support Detail

**APPENDIX A**

**WATER METER SIZING CALCULATION SHEET AND EXAMPLE**



450 Cowie Hill Road, PO Box 8388, RPO CSC  
Halifax, Nova Scotia, B3K 5M1  
Phone: (902) 490-6918  
Fax: (902) 490-1584  
Email: [EngineeringApprovals@HalifaxWater.ca](mailto:EngineeringApprovals@HalifaxWater.ca)

Date:	_____	Building Permit Number:	_____
Name:	_____	Email:	_____
Phone Number:	(      ) _____	Fax Number:	(      ) _____
Location/Address:	_____		
Property Identification Number (PID):	_____	Lot Number:	_____
Premise Use:	_____		
Type of Premise:	<input type="checkbox"/> Residential	<input type="checkbox"/> Multi-Unit Res.	<input type="checkbox"/> Industrial <input type="checkbox"/> Commercial <input type="checkbox"/> Institutional
Degree of Hazard:	<input type="checkbox"/> Minor	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe    Number of Multi-Units: _____

Step 1 – Fixture Demand (reference Plumbing Code of Canada – 2.6.3.2 Hydraulic Load) – Adjust fixture value as required for public, commercial, industrial and institutional uses. Attach calculation sheets. Use AWWA M22.

### Step 2 – Calculate Customer Unadjusted Peak Demand

Page 1 of 2

## WATER METER SIZING CALCULATION SHEET FOR NON-FIRE SERVICE WATER METERS

### Calculation continued

#### Step 3 – Apply Pressure Adjustment Factor

\_\_\_\_\_ kPa (\_\_\_\_\_ Psi) Pressure Factor From Table 4.1 = \_\_\_\_\_ (C)  
Customer Adjusted Peak Demand (B X C) = \_\_\_\_\_ usgpm (D)

#### Step 4 – Add Underground Irrigation Demand

Underground Sprinklers			Sections (1 section = 100 ft <sup>2</sup> )		
Spray Systems	1.16	x	_____	=	_____ usgpm (E)
Rotary Systems	0.4	x	_____	=	_____ usgpm (F)
Total Irrigation Flow (E + F)				=	_____ usgpm (G)

#### Step 5 – Calculate Total Peak Demand


Total Peak Demand (D + G) = \_\_\_\_\_ usgpm (H)

#### Step 6 – Size and Select Water Meter (Refer to 3.1.2 of the Manual)

##### Meter Selection

Water Meter Make: \_\_\_\_\_  
Water Meter Model: \_\_\_\_\_  
Water Meter Size (H < 90% of Water Meter Rated Peak Instantaneous Flow) = \_\_\_\_\_ mm (I)  
Water Meter Size (maximum allowable pressure drop of 48 kPa (7 Psi)) = \_\_\_\_\_ mm (J)  
  
Meter Size Calculated (greater of I or J) = \_\_\_\_\_ mm  
Indoor or Outdoor Installation = \_\_\_\_\_  
  
Water Service Connection Size (for information) = \_\_\_\_\_ mm

### Water Meter Sizing Certification

Designer: \_\_\_\_\_  
Professional Engineer or Licensed Plumber (Print) (Signature)  
  
Company: \_\_\_\_\_ Seal:   
Phone Number: (\_\_\_\_\_) \_\_\_\_\_  
Email: \_\_\_\_\_  
Comments: \_\_\_\_\_

# **WATER METER SIZING CALCULATION SHEET FOR NON-FIRE SERVICE WATER METERS**

## **Applicant, Customer & Premise Information**

Date: Example Calculation Building Permit Number: \_\_\_\_\_  
 Name: \_\_\_\_\_ Email: \_\_\_\_\_  
 Phone Number: (\_\_\_\_) \_\_\_\_\_ Fax Number: (\_\_\_\_) \_\_\_\_\_  
 Location/Address: \_\_\_\_\_  
 Property Identification Number (PID): \_\_\_\_\_ Lot Number: \_\_\_\_\_  
 Premise Use: \_\_\_\_\_  
 Type of Premise: ☐ Residential ☐ Multi-Unit Res. ☐ Industrial ☐ Commercial ☐ Institutional  
 Degree of Hazard: ☐ Minor ☐ Moderate ☐ Severe Number of Multi-Units: \_\_\_\_\_

## **Calculation**

Step 1 – Fixture Demand (reference Plumbing Code of Canada – 2.6.3.2 Hydraulic Load) – Adjust fixture value as required for public, commercial, industrial and institutional uses. Attach calculation sheets. Use AWWA M22.

Fixture	Fixture Value		Number of Fixtures		Fixture Units
Bathroom group w 6LPF tank	3.6	x	50	=	180
Bathtub with ½" spout	1.4	x		=	
Bathtub with ¾" spout	10	x	50	=	500
Bidet	2.0	x		=	
Clothes washer 3.5 kg	1.4	x	50	=	70
Dishwasher, domestic	1.4	x		=	
Hose Bids ½"	2.5	x	100	=	250
Kitchen Sink 8.3 LPM	1.4	x	50	=	70
Lavatory < 8.3 LPM	0.7	x		=	
Lavatory > 8.3 LPM	1.0	x	150	=	150
Showerhead < 9.5 LPM	1.4	x		=	
Showerhead > 9.5 LPM	2.0	x	50	=	100
Urinal with flush tank	3	x		=	
Urinal wall self-closing valve	2	x		=	
Water cist flush tank > 6 LPF	2.2	x		=	
Water cist flush tank < 6 LPF	3.0	x	50	=	150
Wash sink (each set faucets)	1			=	
Other:					
		x		=	
		x		=	
<b>Combined Fixture Value Total</b>				<b>=</b>	<b>1470 (A)</b>

## **Step 2 – Calculate Customer Unadjusted Peak Demand**

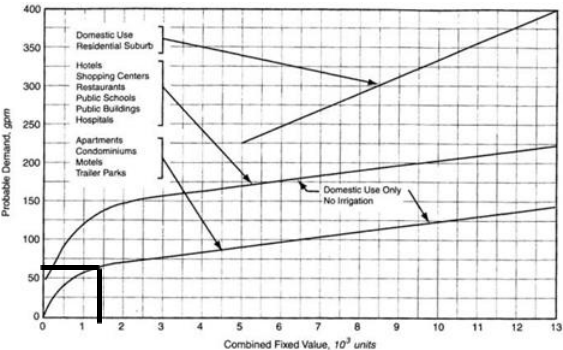
Customer Unadjusted Peak Demand extrapolated from Figure 4-2 or Figure 4-3 = 65 usgpm (B)





## Water Meter Sizing Calculation Methodology

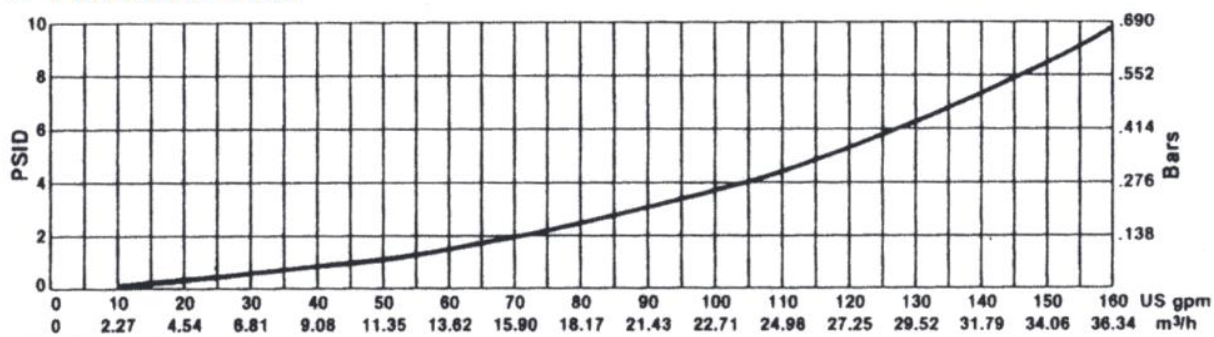
The following methodology is based on the AWWA *M22 Sizing Water Service Lines and Meters*. Design Engineer is expected to purchase and use this publication when completing this methodology. A multi-unit apartment building of 50 units has been chosen as an example to demonstrate the use of this method.

Methodology	Example
<p><b>Step 1 – Calculate Customer Total Fixture Values</b></p> <p><i>The key point to make is that this method is based on the Fixture Values (which are actual peak flows that the device produces) and not Fixture Units.</i></p> <p><i>Note: for phased development separate calculation sheets must be prepared for each phase and also for the buildout. Meters are to be sized for the respective phase but the chamber/building space must be sized for the ultimate meter.</i></p> <p><b>Step 2 – Calculate Customer Unadjusted Peak Demand</b></p> <p><i>This step is a summation of the total fixture values in the development.</i></p>  <p>Figure 4-3 Water flow demand per fixture value—high range</p>	<p>In this example there are the following fixtures in each unit:</p> <p>1 bathroom group, bathtub, clothes washers, 2 hose bib, 1 stand-alone shower, Water closet, 3 bathroom sinks and 1 kitchen sink,</p> <p>If a fixture is provided that is not listed then the peak flow value (fixture value) can be included based on the manufacturer's information.</p> <p>The total fixture value for this development is 1470 usgpm. In other words this is the peak flow that would be realized if all fixtures were turned on at the same time. The corresponding actual estimated peak flow based on probability of services being on at the same time is 65 usgpm. This is calculated using the Apartments curve on Figure 4-3 Water flow demand per fixture value—high range.</p>

Methodology	Example
<p><b>Step 3 – Apply Pressure Adjustment Factor</b></p> <p><i>This step increases or decreases the peak demand based on the pressure at the outlet of the meter. The pressure adjustment factors can be found in Table 4-1.</i></p> <p><b>Step 4 – Add Underground Irrigation Demand</b></p> <p><i>There are two types of underground irrigation system included in the calculation spray and rotary. The total irrigation demand is calculated using the total irrigated area and dividing it by 100 ft<sup>2</sup> to convert it to sections. The number of sections is multiplied by the appropriate factor to arrive at the irrigation rate.</i></p> <p><b>Step 5 – Calculate Total Peak Fixed Demand</b></p> <p><i>Add up the flows from Step 3 and Step 4.</i></p>	<p>The pressure after the meter in this case is 55 psi. Therefore the adjustment factor is 0.95 and the adjusted flow is 62 usgpm.</p> <p>In this example the total irrigation area is 4,300 ft<sup>2</sup> (400 m<sup>2</sup>) and it is irrigated by a spray irrigation system. The corresponding peak demand is 50 usgpm.</p> <p>The total peak fixed demand is 112 usgpm.</p>

<i>Methodology</i>	<i>Example</i>
<p><b>Step 6 – Size and Select Water Meter</b></p> <p><i>The meter size and type must be evaluated against two requirements:</i></p> <ol style="list-style-type: none"> <li><i>1) The total peak fixed demand must be less than 90% of the rated maximum instantaneous flow rating of the meter; and</i></li> <li><i>2) The pressure loss at the total peak fixed demand must be less than 48 kPa (7psi).</i></li> </ol> <p><i>Typically the pressure loss criteria will govern.</i></p>	<p>Since the total peak flow is 112 usgpm the positive displacement meter is chosen for consideration.</p> <p>For the 2" (50mm) Neptune T-10 the rated peak instantaneous flow is 160 usgpm. 90% of this is 144 usgpm.</p> <p>The pressure loss at 112 usgpm is 35 kPa (5 psi), according to the manufacturer's literature.</p> <p>Therefore the 50mm PD meter is selected for this application.</p>

## 2" PRESSURE LOSS



From the Neptune T-10 specification sheet.



SITE PLAN  
SCALE 1:500

PLAN VIEW — METER & BFP ARRANGEMENT  
SCALE 1:50

WATER METER SIZING  
CALCULATION SHEET

WATER METER SIZING  
CALCULATION SHEET

PROFILE VIEW — METER & BFP ARRANGEMENT  
SCALE 1:50

KEY PLAN  
SCALE 1:10 000

PLAN LEGEND

NOTES

3					
2					
1					
No.	Date	Revision	Description	App'd	App'd



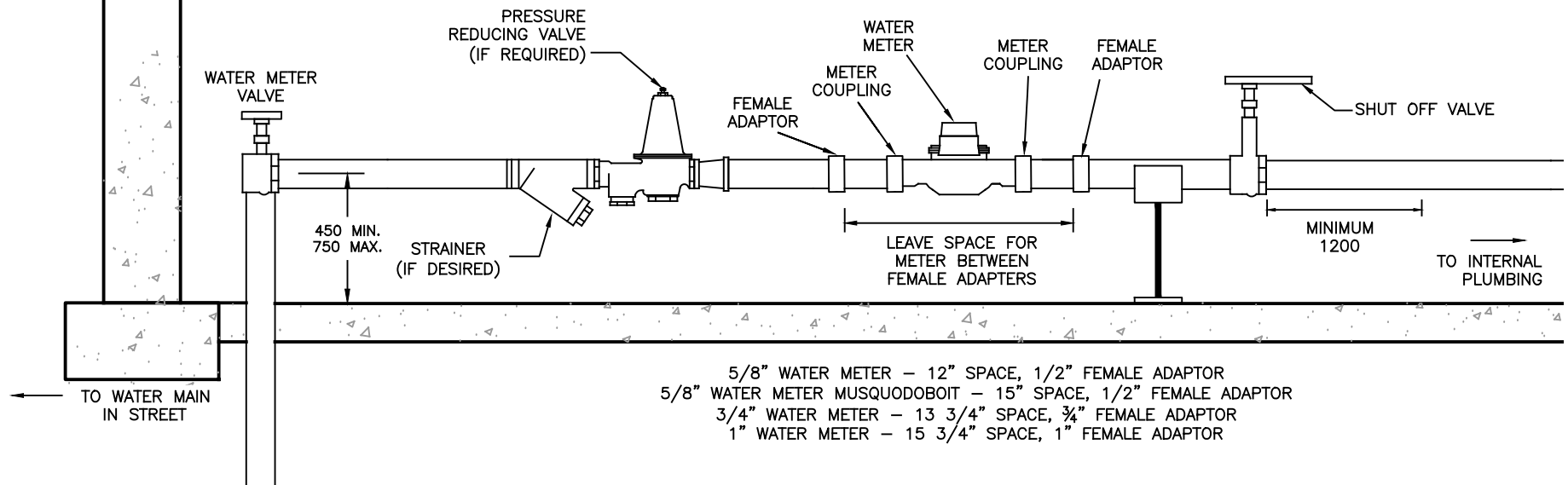
X STREET  
FROM — TO —  
HALIFAX/DARTMOUTH, NOVA SCOTIA

SERVICING/WATER METER & BACKFLOW  
PREVENTION/CALCULATION DRAWING

Date	—	Drawn	—	Tender No.	—
Scale	Metres : 1:50	Checked	—	Sheet	—
Reference	—	Survey No.	—	Drawing No.	HW#XXXX


**APPENDIX B**

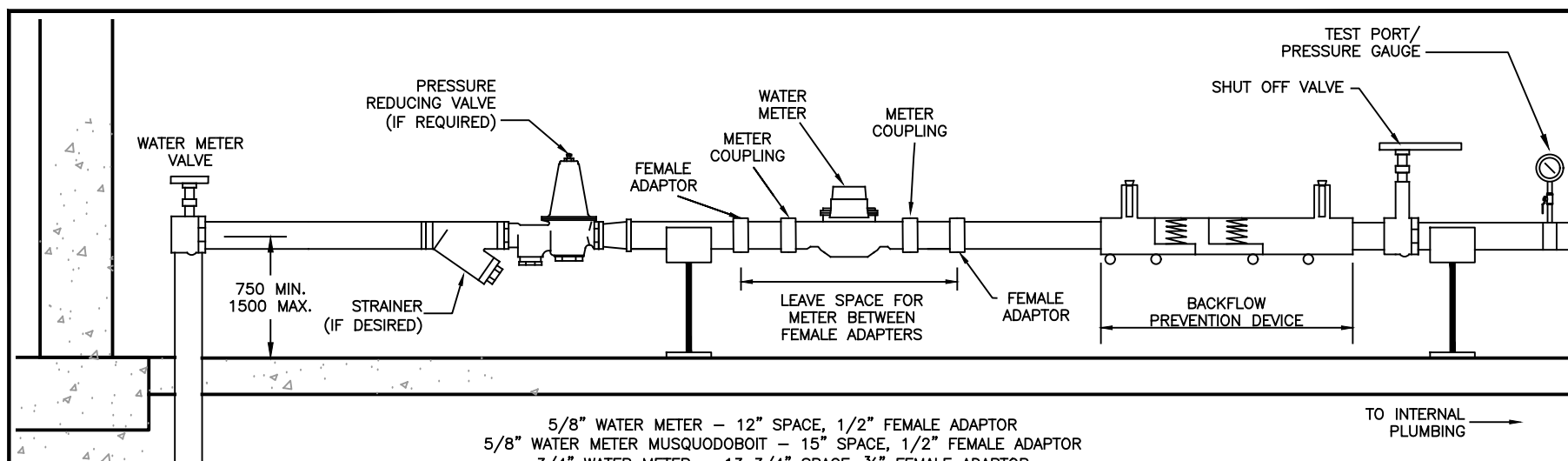
**SUPPLEMENTARY STANDARD DETAILS**



#### NOTES:

- ALL PRODUCTS AND MATERIALS ARE REQUIRED TO BE NSF-61 COMPLIANT.
- METER, METER COUPLING AND OUTSIDE REMOTE ARE SUPPLIED AND INSTALLED BY HRWC.
- ALL PIPE MATERIAL IS REQUIRED TO BE TYPE K COPPER TUBING TO ASTM B88.
- FOR PEX<sub>a</sub> WATER SERVICE CONNECTIONS, USE ASTM 2080 COMPRESSION SLEEVE FITTING TO TRANSITION TO THE COPPER TUBING OF THE WATER METER ARRANGEMENT.
- WATER METER TO BE INSTALLED WITHIN 1200 mm OF WHERE THE SERVICE CONNECTION ENTERS THE BUILDING.
- ARRANGEMENT IS TO BE NO LESS THAN 450 mm AND NO MORE THAN 750mm FROM THE FLOOR.
- MINIMUM OF 1200 mm STRAIGHT LENGTH OF TYPE K COPPER TUBING DOWNSTREAM OF THE WATER METER. SECURE THE COPPER TUBING TO THE WALL OR FLOOR.
- THE ARRANGEMENT IS REQUIRED TO BE HORIZONTALLY LEVEL AND HAVE SUFFICIENT ROOM FOR ACCESS.
- A SHUT OFF VALVE MAY BE SUBSTITUTED FOR THE WATER METER VALVE.
- PROVIDE 1/2" CONDUIT THROUGH FOUNDATION OR EXTERIOR WALL CLOSEST TO THE WATER METER FOR PURPOSE OF INSTALLING AN OUTSIDE REMOTE. PROVIDE SOLID 22 GAUGE, 3 OR 4 STRANDED CONDUCTOR WIRE FROM THE WATER METER TO THE EXTERIOR LOCATION FOR THE OUTSIDE REMOTE.
- INSTALL OUTSIDE REMOTE ON THE DRIVEWAY SIDE OF THE BUILDING OR WHERE DIRECTED BY HRWC.
- ALL COMPONENTS ILLUSTRATED MUST BE INSTALLED PRIOR TO THE WATER METER INSTALLATION.
- THE BUILDING IS REQUIRED TO BE ROOF TIGHT, WITH EXTERIOR SIDING INSTALLED, AND THE CURB STOP AND SERVICE BOX ARE TO BE PLUMB AND LEVEL WITH FINISHED LANDSCAPING PRIOR TO WATER METER INSTALLATION.

					<div>NOTE: ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</div> <div></div>	PROJECT		PROFILE OF 16mm, 19mm & 25mm (5/8", 3/4" & 1") WATER METER ARRANGEMENT	
						DRAWN	J.W./SJT	SCALE (PLAN)	
						CHECKED	J.D.	SCALE (PROFILE)	N.T.S.
						APPROVED	K.G.	DATE	08/05/17
						PROJECT No.			
						DWG. No.			
						HWSD-001			
1	NEW DETAIL FOR 2017			08/05/17	ST	KG			
No.	DESCRIPTION			DATE	BY	CHKD			



5/8" WATER METER – 12" SPACE, 1/2" FEMALE ADAPTOR  
 5/8" WATER METER MUSQUODOBOIT – 15" SPACE, 1/2" FEMALE ADAPTOR  
 3/4" WATER METER – 13 3/4" SPACE, 3/4" FEMALE ADAPTOR  
 1" WATER METER – 15 3/4" SPACE, 1" FEMALE ADAPTOR

#### NOTES:

- ALL PRODUCTS AND MATERIALS ARE REQUIRED TO BE NSF61 COMPLIANT.
- METER, METER COUPLING AND OUTSIDE REMOTE ARE SUPPLIED BY HRWC.
- ALL PIPE MATERIAL IS REQUIRED TO BE TYPE K COPPER TUBING TO ASTM B88,
- FOR PEX<sub>a</sub> WATER SERVICE CONNECTIONS, USE ASTM 2080 COMPRESSION SLEEVE FITTING TO TRANSITION TO THE COPPER TUBING OF THE WATER METER ARRANGEMENT.
- WATER METER TO BE INSTALLED WITHIN 1200 mm OF WHERE THE SERVICE CONNECTION ENTERS THE BUILDING.
- ARRANGEMENT IS TO BE NO LESS THAN 750 mm AND NO MORE THAN 1500 mm FROM THE FLOOR.
- MINIMUM OF 1200 mm STRAIGHT LENGTH OF TYPE K COPPER TUBING DOWNSTREAM OF SHUT OFF VALVE #2. SECURE THE COPPER TUBING TO THE WALL OR FLOOR.
- THE ARRANGEMENT IS REQUIRED TO BE HORIZONTALLY LEVEL AND HAVE SPECIFIED ROOM FOR ACCESS.
- A SHUT OFF VALVE MAY BE SUBSTITUTED FOR THE WATER METER VALVE.
- PROVIDE 1/2" CONDUIT THROUGH FOUNDATION OR EXTERIOR WALL CLOSEST TO THE WATER METER FOR PURPOSE OF INSTALLING AN OUTSIDE REMOTE PROVIDE SOLID 22 GAUGE, 3 OR 4 STRANDED CONDUCTOR WIRE FROM THE WATER METER TO THE EXTERIOR LOCATION FOR THE OUTSIDE REMOTE.
- INSTALL OUTSIDE REMOTE ON THE DRIVEWAY SIDE OF THE BUILDING OR WHERE DIRECTED BY HRWC.
- ALL COMPONENTS ILLUSTRATED MUST BE INSTALLED PRIOR TO THE WATER METER INSTALLATION
- THE BUILDING IS REQUIRED TO BE ROOF TIGHT, WITH EXTERIOR SIDING INSTALLED, AND THE CURB STOP AND SERVICE BOX ARE TO BE PLUMB AND LEVEL WITH FINISHED LANDSCAPING PRIOR TO WATER METER INSTALLATION.

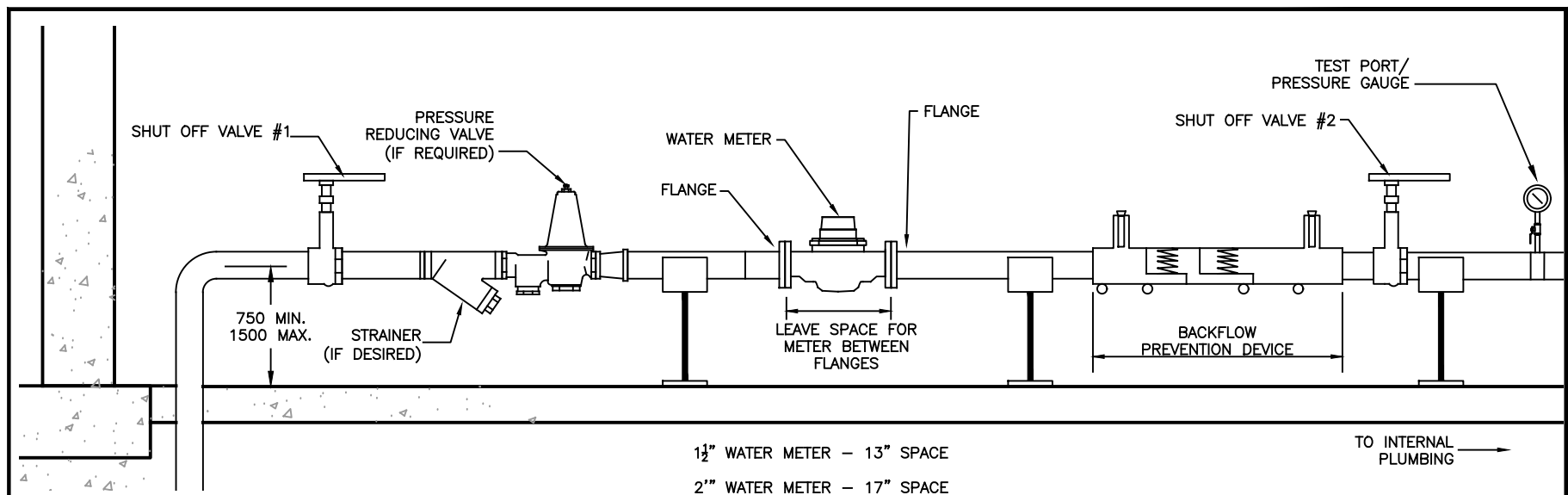
1	NEW DETAIL FOR 2017	08/05/17	ST	KG
No.	DESCRIPTION	DATE	BY	CHKD

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		PROFILE OF 15mm, 19mm & 25mm (5/8", 3/4" & 1") WATER METER & BACKFLOW PREVENTION DEVICE ARRANGEMENT	
DRAWN	S.T.	SCALE	(PLAN)
CHECKED	J.D.	SCALE	(PROFILE) N.T.S.
APPROVED	K.G.	DATE	08/05/17
PROJECT No.			
DWG. No.		HWSD – 002	





#### NOTES:

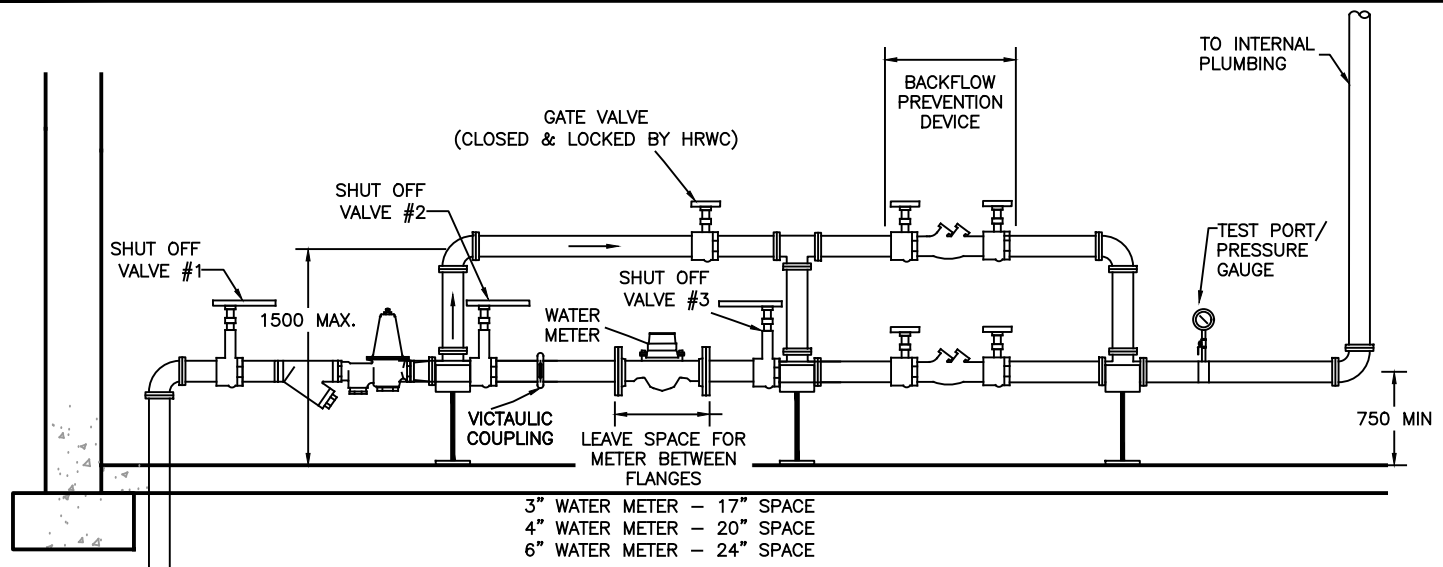
- ALL PRODUCTS AND MATERIALS ARE REQUIRED TO BE NSF61 COMPLIANT.
- METER AND OUTSIDE REMOTE ARE SUPPLIED BY HRWC.
- ALL PIPE MATERIAL IS REQUIRED TO BE TYPE K COPPER TUBING TO ASTM B88, OR DUCTILE IRON, SPECIAL CLASS 52/54 TO AWWA C151.
- FOR PEX<sub>a</sub> WATER SERVICE CONNECTIONS, USE ASTM 2080 COMPRESSION SLEEVE FITTING TO TRANSITION TO THE COPPER TUBING OF THE WATER METER ARRANGEMENT.
- WATER METER TO BE INSTALLED WITHIN 1200 mm OF WHERE THE SERVICE CONNECTION ENTERS THE BUILDING.
- ARRANGEMENT IS TO BE NO LESS THAN 750 mm AND NO MORE THAN 1500mm FROM THE FLOOR.
- MINIMUM OF 1200 mm STRAIGHT LENGTH OF TYPE K COPPER TUBING OR DUCTILE IRON DOWNSTREAM OF THE WATER METER. SECURE THE PIPING TO THE WALL OR FLOOR.
- THE ARRANGEMENT IS REQUIRED TO BE HORIZONTALLY LEVEL AND HAVE SPECIFIED ROOM FOR ACCESS
- PROVIDE  $\frac{1}{2}$ " CONDUIT THROUGH FOUNDATION OR EXTERIOR WALL CLOSEST TO THE WATER METER FOR PURPOSE OF INSTALLING AN OUTSIDE REMOTE. PROVIDE SOLID 22 GAUGE, 3 OR 4 STRANDED CONDUCTOR WIRE FROM THE WATER METER TO THE EXTERIOR LOCATION FOR THE OUTSIDE REMOTE.
- INSTALL OUTSIDE REMOTE ON THE DRIVEWAY SIDE OF THE BUILDING OR WHERE DIRECTED BY HRWC.
- ALL COMPONENTS ILLUSTRATED MUST BE INSTALLED PRIOR TO THE WATER METER INSTALLATION.
- THE BUILDING IS REQUIRED TO BE ROOF TIGHT, WITH EXTERIOR SIDING INSTALLED, AND THE CURB STOP AND SERVICE BOX ARE TO BE PLUMB AND LEVEL WITH FINISHED LANDSCAPING PRIOR TO WATER METER INSTALLATION.

1	NEW DETAIL FOR 2017	08/05/17	ST	KG	
No.	DESCRIPTION	DATE	BY	CHKD	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.




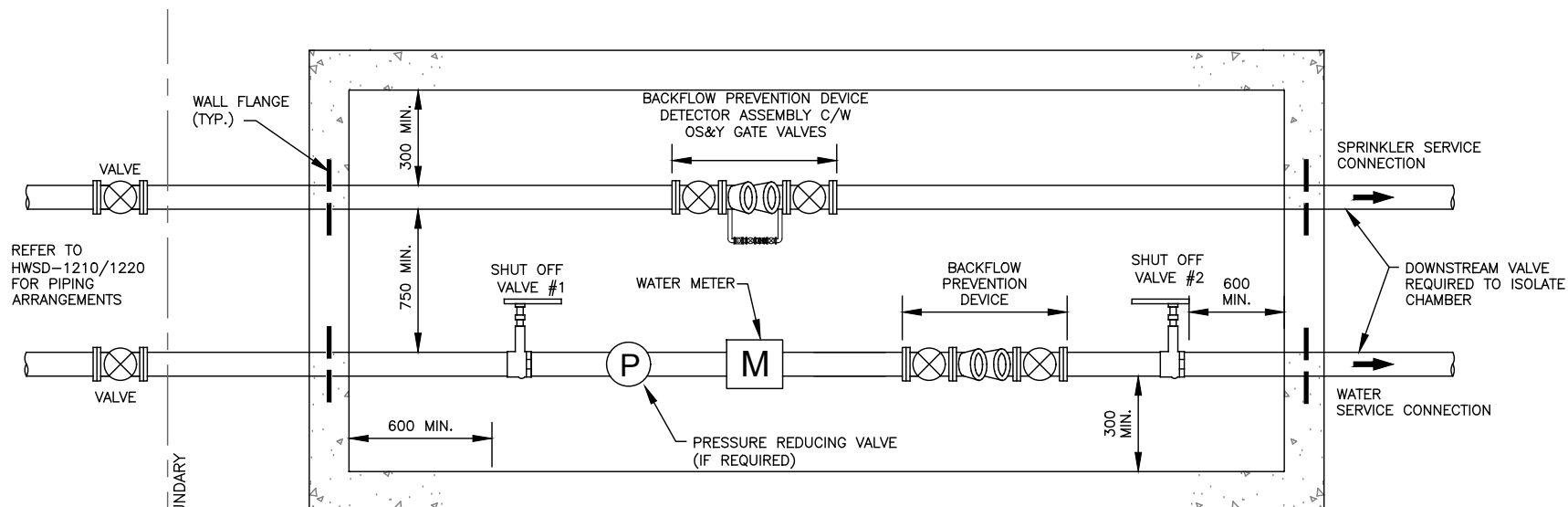
PROJECT		PROFILE OF 38 mm & 50 mm (1-1/2" & 2") WATER METER & BACKFLOW PREVENTION DEVICE	
DRAWN	S.T.	SCALE	(PLAN)
CHECKED	J.D.	SCALE	(PROFILE) N.T.S.
APPROVED	K.G.	DATE	08/05/17
PROJECT No.			
DWG. No.		HWSD - 003	



#### NOTES:

- ALL PRODUCTS AND MATERIALS ARE REQUIRED TO BE NSF61 COMPLIANT.
- WATER METER AND OUTSIDE REMOTE ARE SUPPLIED BY HRWC.
- ALL PIPE MATERIAL IS REQUIRED TO BE TYPE K COPPER TUBING TO ASTM B88, OR DUCTILE IRON, SPECIAL CLASS 52/54 TO AWWA C151.
- FOR PEX<sub>a</sub> WATER SERVICE CONNECTIONS, USE ASTM 2080 COMPRESSION SLEEVE FITTING TO TRANSITION TO THE COPPER TUBING OF THE WATER METER ARRANGEMENT.
- WATER METER TO BE INSTALLED WITHIN 1200 mm OF WHERE THE SERVICE CONNECTION ENTERS THE BUILDING.
- ARRANGEMENT IS TO BE NO LESS THAN 750 mm AND NO MORE THAN 1500mm FROM THE FLOOR.
- PROVIDE STRAIGHT LENGTH OF PIPE EQUAL TO 5 TIMES THE DIAMETER OF THE PIPE UPSTREAM AND DOWNSTREAM OF THE WATER METER.
- THE ARRANGEMENT IS REQUIRED TO BE HORIZONTALLY LEVEL AND HAVE SPECIFIED ROOM FOR ACCESS.
- PROVIDE ½" CONDUIT THROUGH FOUNDATION OR EXTERIOR WALL CLOSEST TO THE WATER METER FOR PURPOSE OF INSTALLING AN OUTSIDE REMOTE. PROVIDE SOLID 22 GAUGE, 3 OR 4 STRANDED CONDUCTOR WIRE FROM THE WATER METER TO THE EXTERIOR LOCATION FOR THE OUTSIDE REMOTE.
- INSTALL OUTSIDE REMOTE ON THE DRIVEWAY SIDE OF THE BUILDING OR WHERE DIRECTED BY HRWC.
- ALL COMPONENTS ILLUSTRATED MUST BE INSTALLED PRIOR TO THE WATER METER INSTALLATION.
- THE BUILDING IS REQUIRED TO BE ROOF TIGHT, WITH EXTERIOR SIDING INSTALLED, AND THE CURB STOP AND SERVICE BOX ARE TO BE PLUMB AND LEVEL WITH FINISHED LANDSCAPING PRIOR TO WATER METER INSTALLATION.
- DETAILS OF THRUST RESTRAINT SYSTEM AND PIPE SUPPORTS TO BE DESIGNED AND STAMPED BY THE DESIGN ENGINEER.

						<div>NOTE: ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.</div> <div></div>	<div>PROJECT</div> <div>PROFILE OF 75mm (3") AND GREATER WATER METER AND BACKFLOW PREVENTION DEVICE BY-PASS ARRANGEMENT</div>	
							<div>DRAWN</div> <div>S.T.</div>	<div>SCALE (PLAN)</div>
							<div>CHECKED</div> <div>J.D.</div>	<div>SCALE (PROFILE)</div> <div>N.T.S.</div>
							<div>APPROVED</div> <div>K.G.</div>	<div>DATE</div> <div>08/05/17</div>
							<div>PROJECT No.</div>	
							<div>DWG. No.</div> <div>HWSD – 004</div>	
1	NEW DETAIL FOR 2017				08/05/17	ST	KG	
No.	DESCRIPTION				DATE	BY	CHKD	



NOTES:

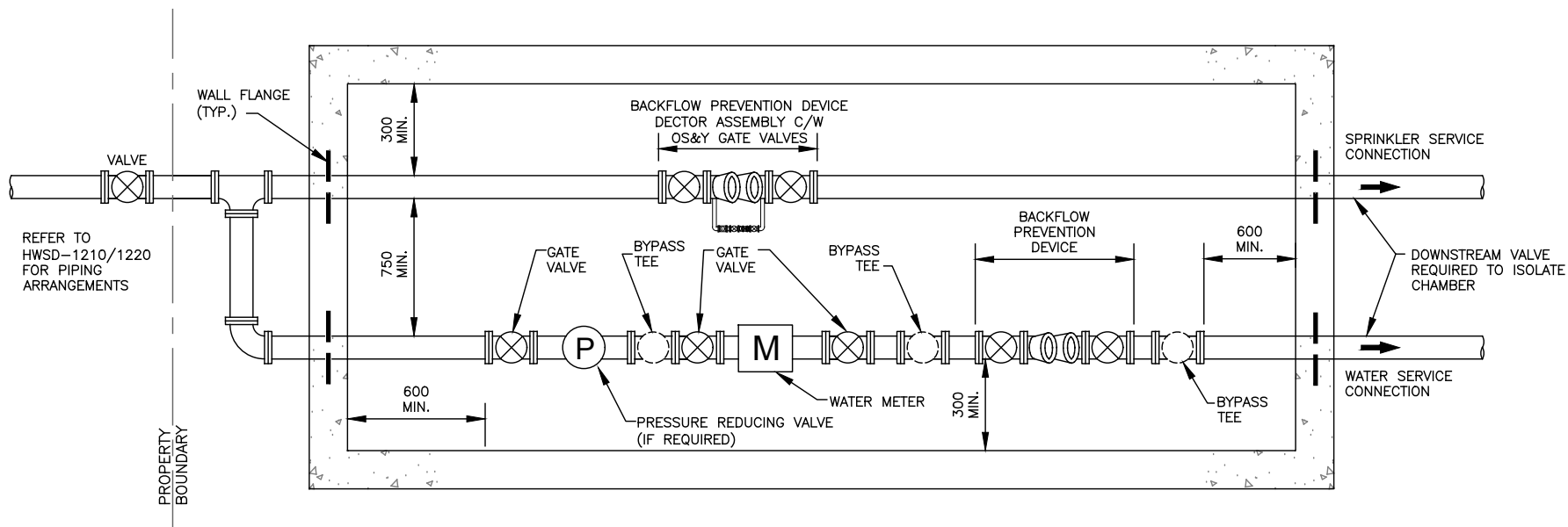
1. ALL NOTED DIMENSIONS / SPACING REQUIREMENTS WITH REGARDS TO CHAMBER WALLS.
2. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICES ARE NOT PERMITTED IN BELOW GRADE CHAMBERS.
3. REFER TO HRWC SUPPLEMENTARY STANDARD SPECIFICATION FOR ABOVE GROUND HEATED ENCLOSURE REQUIREMENTS.
4. REFER TO HWSD-002 AND HWSD-003 FOR THE APPLICABLE PROFILE ARRANGEMENT.

1	NEW DETAIL FOR 2017	08/05/28	ST	KG	
No.	DESCRIPTION	DATE	BY	CHKD	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		PLAN OF 16mm TO 50mm (5/8" TO 2") WATER METER & BACKFLOW PREVENTION DEVICE EXTERIOR CHAMBER ARRANGEMENT	
DRAWN	S.T.	SCALE	N.T.S.
CHECKED	J.D.	SCALE	(PROFILE)
APPROVED	K.G.	DATE	08/05/17
PROJECT No.			
DWG. No.		HWSD - 005	



NOTES:

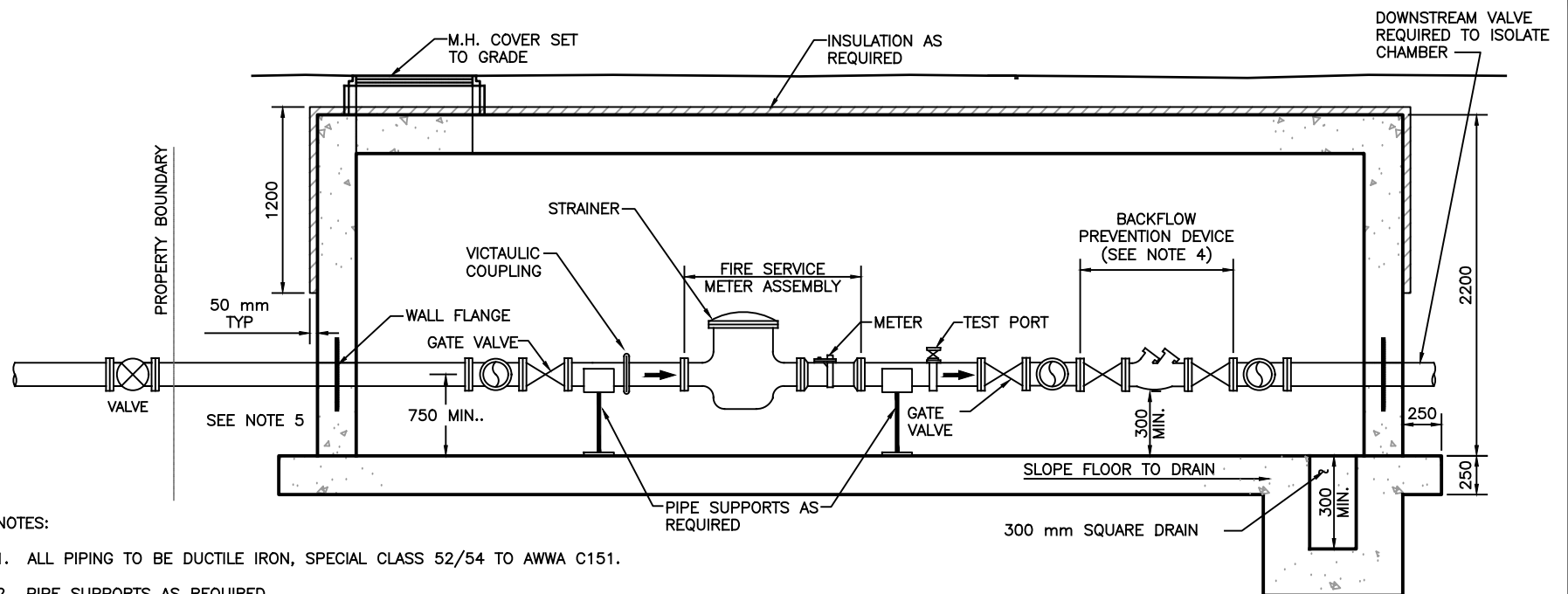
1. ALL NOTED DIMENSIONS / SPACING REQUIREMENTS WITH REGARDS TO CHAMBER WALLS.
2. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICES ARE NOT PERMITTED IN BELOW GRADE CHAMBERS.
3. REFER TO HRWC SUPPLEMENTARY STANDARD SPECIFICATION FOR ABOVE GROUND HEATED ENCLOSURE REQUIREMENTS.
4. REFER TO HWSD-004 FOR THE PROFILE ARRANGEMENT.

1	NEW DETAIL FOR 2017	08/05/17	ST	KG	
No.	DESCRIPTION	DATE	BY	CHKD	

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT PLAN OF 75mm(3") & GREATER WATER METER AND BACKFLOW PREVENTION DEVICES WITH BYPASS EXTERIOR CHAMBER ARRANGEMENT			
DRAWN	S.T.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	08/05/17
PROJECT No.			
DWG. No.		HWSD - 006	



NOTES:

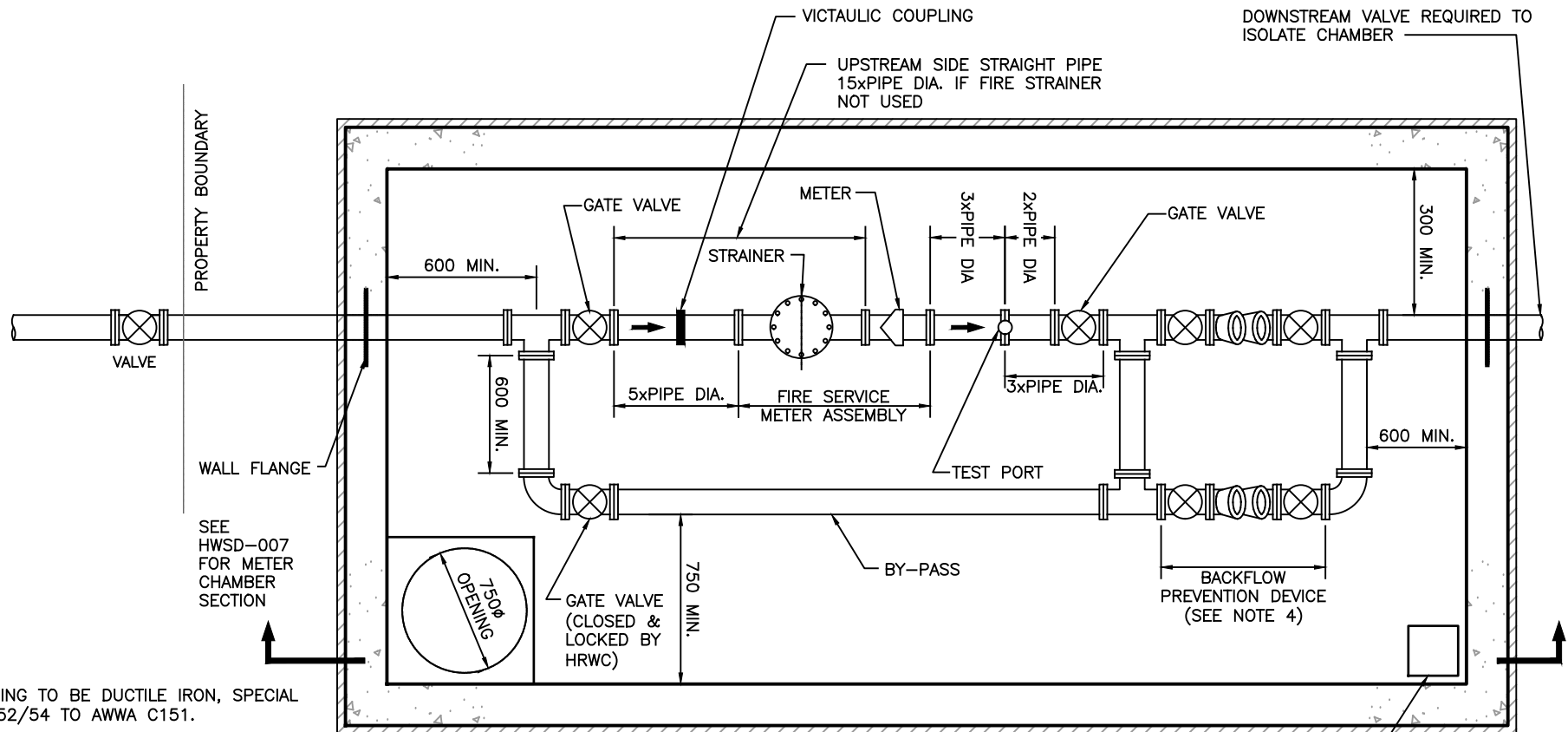
1. ALL PIPING TO BE DUCTILE IRON, SPECIAL CLASS 52/54 TO AWWA C151.
2. PIPE SUPPORTS AS REQUIRED.
3. M.H. COVER = HRWC SPEC, IMP R-90 PROVIDE 45 mm $\phi$  HOLE AND 100 mm $\phi$ -6 mm DEPTH COUNTERSINK IN COVER FOR REMOTE METER REGISTER.
4. PIPEWORK TO BE DESIGNED TO ACCOMMODATE POTENTIAL DIFFERENTIAL SETTLEMENT OF STRUCTURE.
5. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICES ARE NOT PERMITTED IN BELOW GRADE CHAMBERS. REFER TO HRWC SUPPLEMENTARY STANDARD SPECIFICATION FOR ABOVE GROUND HEATED ENCLOSURE REQUIREMENTS.

1	NEW DETAIL FOR 2017	08/05/17	ST	KG
No.	DESCRIPTION	DATE	BY	CHKD

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT		PROFILE MASTER WATER METER CHAMBER	
DRAWN	S.T.	SCALE	(PLAN)
CHECKED	J.D.	SCALE	(PROFILE) N.T.S.
APPROVED	K.G.	DATE	08/05/17
PROJECT No.			
DWG. No.		HWSD - 007	



NOTES:

1. ALL PIPING TO BE DUCTILE IRON, SPECIAL
2. CLASS 52/54 TO AWWA C151.
3. PIPE SUPPORTS AS REQUIRED.
4. M.H. COVER = HRWC SPEC, IMP R-90. PROVIDE 45mmØ HOLE AND 100 mmØ-6 mm DEPTH COUNTERSINK IN COVER FOR REMOTE METER REGISTER.
5. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICES ARE NOT PERMITTED IN BELOW GRADE CHAMBERS.
6. REFER TO HRWC SUPPLEMENTARY STANDARD SPECIFICATION FOR ABOVE GROUND HEATED ENCLOSURE REQUIREMENTS.

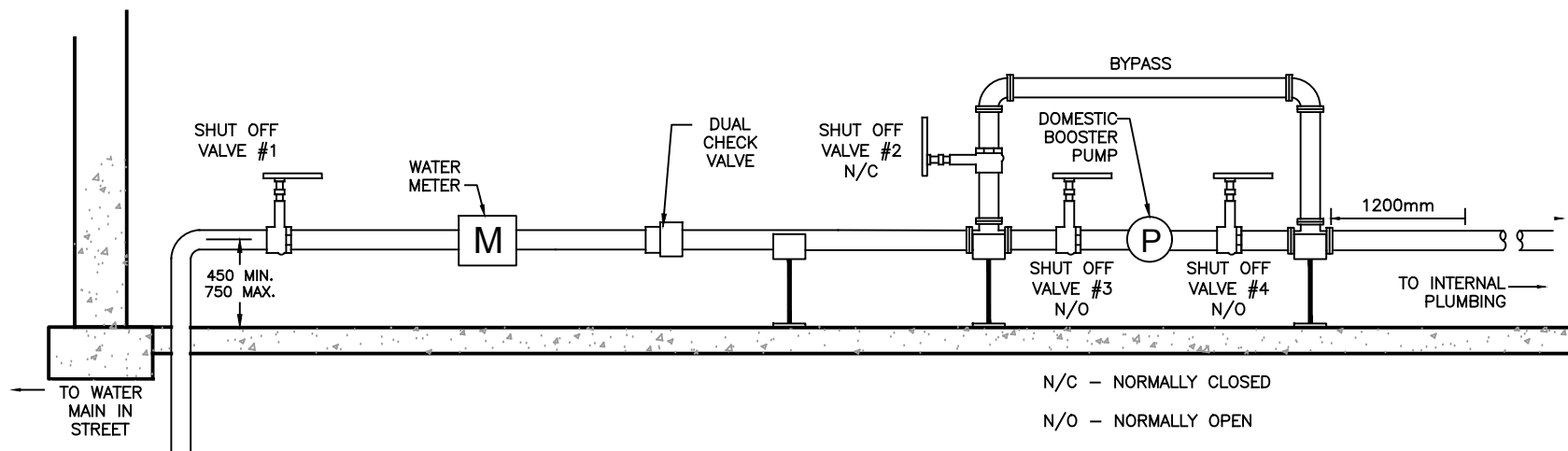
300 mm SQUARE DRAIN. MINIMUM DEPTH 300 mm BELOW FLOOR SURFACE.

1	NEW DETAIL FOR 2017	98 01 22	ST	KG
No.	DESCRIPTION	DATE	BY	CHKD

NOTE:  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.




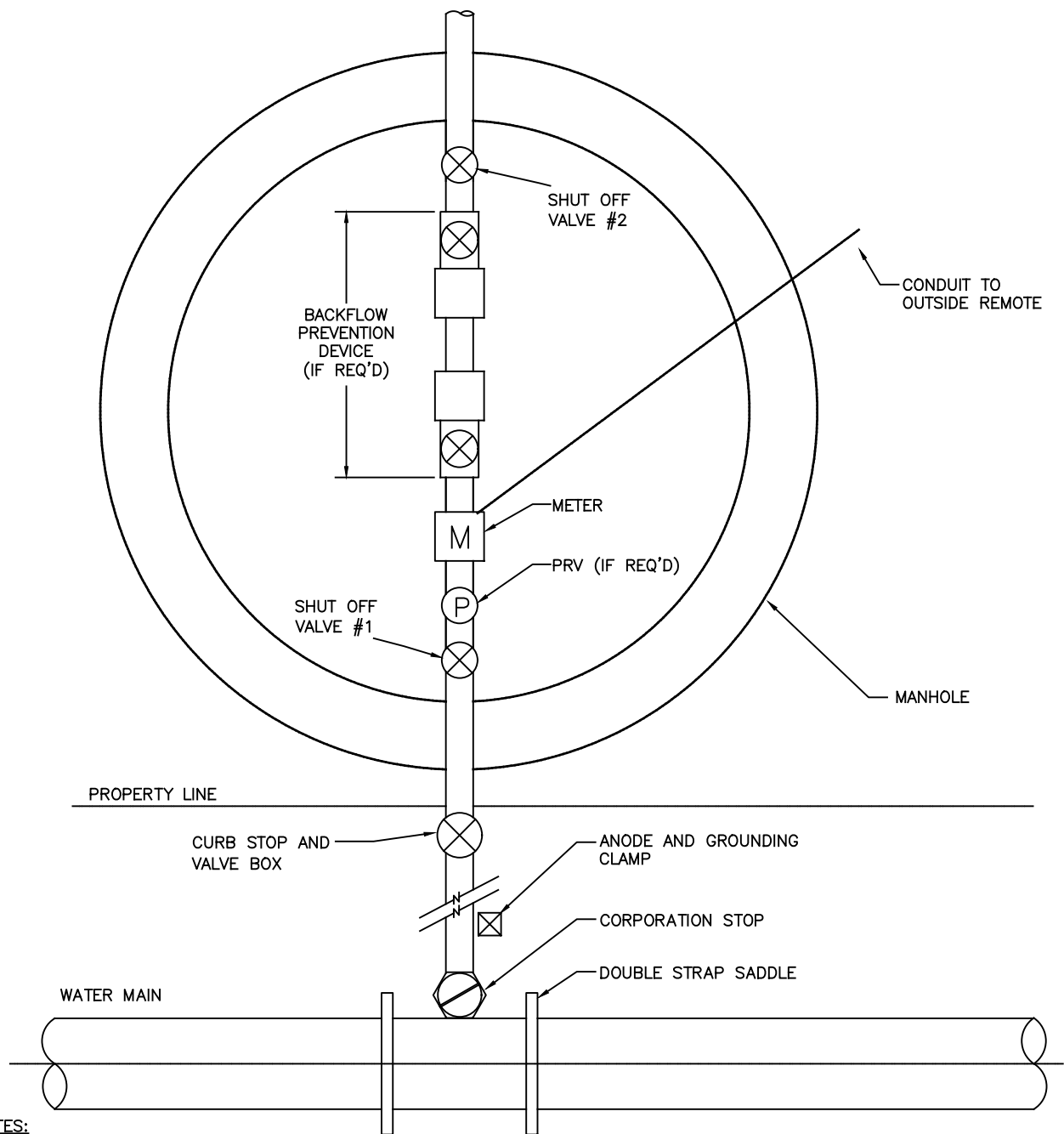
PROJECT			
PLAN MASTER WATER METER CHAMBER			
DRAWN	S.T.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	08/05/17
PROJECT No.			
DWG. No. HWSD - 008			



**NOTES:**

1. ALL PRODUCTS AND MATERIALS ARE REQUIRED TO BE NSF-61 COMPLIANT.
2. DOMESTIC BOOSTER PUMP SIZING AND PRODUCT SPECIFICATION AS PER BUILDING PLUMBING DESIGNER.
3. MINIMUM WATER SERVICE CONNECTION DIAMETER IS 25 mm.
4. REFER TO HWSD-001, HWSD-002 OR HWSD-003 FOR THE APPLICABLE PROFILE ARRANGEMENT.
5. ALL PIPE MATERIAL IS REQUIRED TO BE TYPE K COPPER TUBING TO ASTM B88.
6. FOR PEX<sub>a</sub> WATER SERVICE CONNECTIONS, USE ASTM 2080 COMPRESSION SLEEVE FITTING TO TRANSITION TO THE COPPER TUBING OF THE WATER METER ARRANGEMENT.
7. ARRANGEMENT IS TO BE NO LESS THAN 450 mm AND NO MORE THAN 750mm FROM THE FLOOR.
8. MINIMUM OF 1200 mm STRAIGHT LENGTH OF TYPE K COPPER TUBING DOWNSTREAM OF BY PASS ARRANGEMENT SECURE THE COPPER TUBING TO THE WALL OR FLOOR.
9. THE ARRANGEMENT IS REQUIRED TO BE HORIZONTALLY LEVEL AND HAVE SUFFICIENT ROOM FOR ACCESS.
10. PROVIDE 1/2" CONDUIT THROUGH FOUNDATION OR EXTERIOR WALL CLOSEST TO THE WATER METER FOR PURPOSE OF INSTALLING AN OUTSIDE REMOTE. PROVIDE SOLID 22 GAUGE, 3 OR 4 STRANDED CONDUCTOR WIRE FROM THE WATER METER TO THE EXTERIOR LOCATION FOR THE OUTSIDE REMOTE.
11. INSTALL OUTSIDE REMOTE ON THE DRIVEWAY SIDE OF THE BUILDING OR WHERE DIRECTED BY HRWC.
12. ALL COMPONENTS ILLUSTRATED MUST BE INSTALLED PRIOR TO THE WATER METER INSTALLATION.
13. THE BUILDING IS REQUIRED TO BE ROOF TIGHT, WITH EXTERIOR SIDING INSTALLED, AND THE CURB STOP AND SERVICE BOX ARE TO BE PLUMB AND LEVEL WITH FINISHED LANDSCAPING PRIOR TO WATER METER INSTALLATION.

					<b>NOTE:</b> ALL DIMENSIONS SHOWN IN MILLIMETERS, UNLESS OTHERWISE NOTED.		<b>PROJECT</b>  PROFILE RESIDENTIAL WATER BOOSTER PUMP ARRANGEMENT	
							DRAWN S.T.	SCALE (PLAN)
							CHECKED J.D.	SCALE (PROFILE) N.T.S.
							APPROVED K.G.	DATE 08/05/17
							PROJECT No.	
1	NEW DETAIL FOR 2017				08/05/17	ST	KG	DWG. No. HWSD – 009
No.	DESCRIPTION				DATE	BY	CHKD	



**NOTES:**

1. ALL PIPE, MANHOLE, FRAME AND COVER, VALVES AND FITTINGS TO BE SUPPLIED BY CONTRACTOR.
2. MANHOLE 2400 mm WITH B.F.P, 1800 mm WITHOUT B.F.P.
3. CONTRACTOR TO INSTALL CONDUIT AND SUPPORT/PROTECTION FOR REMOTE REGISTER, SUBJECT TO HRWC APPROVAL.
4. MINIMUM DEPTH OF METER FROM FINISHED GRADE 1600 mm.
5. INSULATION IS REQUIRED. SEE HWSD-1310 FOR DETAILS.
6. SEE HWSD-1180 FOR INSTALLATION OF SERVICES 38 mm AND OVER.
7. SEE HWSD-1310 FOR PRECAST CONCRETE CHAMBER DETAILS
8. SEE HWSD-1460 FOR MANHOLE FRAME AND COVER DETAILS
9. SEE HWSD-001, HWSD-002 OR HWSD-003 FOR WATER METER ARRANGEMENT REQUIREMENTS.

1	NEW DETAIL FOR 2017 SPEC.	08/05/17	ST	KG
No.	DESCRIPTION	DATE	BY	CHKD

**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.

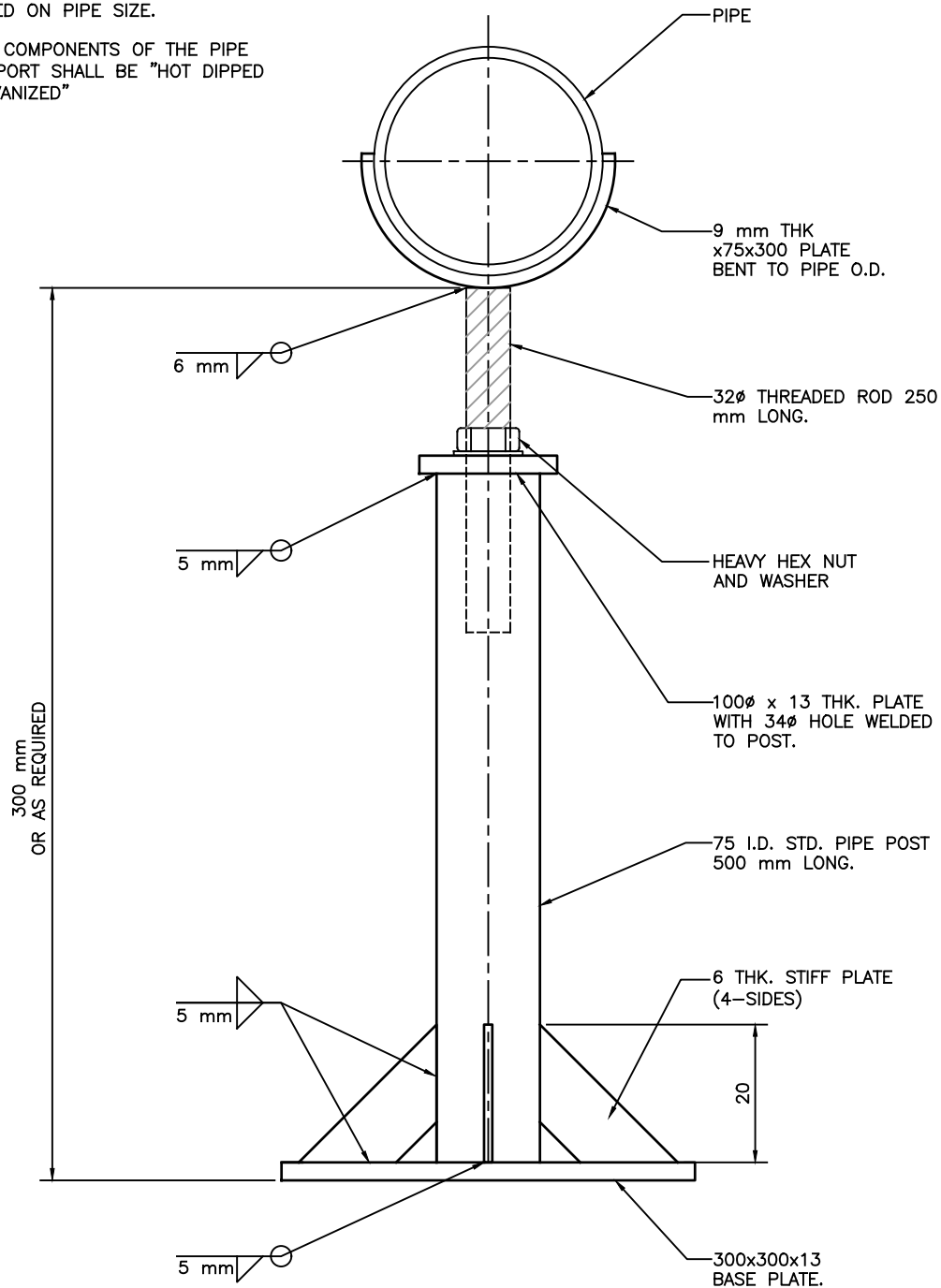


PROJECT		PLAN OF 16mm TO 50mm (5/8" TO 2") WATER METER PIT	
DRAWN	J.W.	SCALE (PLAN)	N.T.S.
CHECKED	J.D.	SCALE (PROFILE)	
APPROVED	K.G.	DATE	08/05/17
PROJECT No.			
DWG. No. HWSD - 010			



**NOTES:**

1. NUMBER OF SUPPORTS NEEDED BASED ON PIPE SIZE.
2. ALL COMPONENTS OF THE PIPE SUPPORT SHALL BE "HOT DIPPED GALVANIZED"



**NOTE:**  
ALL DIMENSIONS SHOWN IN MILLIMETERS,  
UNLESS OTHERWISE NOTED.



PROJECT

PIPE SUPPORT DETAIL

DRAWN	S.T.	SCALE	(PLAN)
CHECKED	J.D.	SCALE	(PROFILE) N.T.S.
APPROVED	K.G.	DATE	08/05/17
PROJECT No.			
DWG. No. HWSD - 011			

No.	DESCRIPTION	DATE	BY	CHKD
1	NEW DETAIL FOR 2017 SPEC	08/05/17	ST	KG

**APPENDIX C**

**HRWC APPLICATIONS**

## HALIFAX WATER

450 Cowie Hill Road, PO Box 8388, RPO CSC  
Halifax, Nova Scotia, B3K 5M1  
Phone: (902) 490-6914  
Fax: (902) 490-1584  
Email: EngineeringApprovals@HalifaxWater.ca

## NEW SERVICE & RENEWAL APPLICATION

### Customer & Premise Information (Required)

Date: \_\_\_\_\_ Building Permit Number: \_\_\_\_\_  
Name: \_\_\_\_\_ Email: \_\_\_\_\_  
Phone Number: ( ) \_\_\_\_\_ Fax Number: ( ) \_\_\_\_\_  
Location/Address: \_\_\_\_\_  
Property Identification Number (PID): \_\_\_\_\_ Lot Number: \_\_\_\_\_  
Premise Use: \_\_\_\_\_  
Type of Premise: ☐ Residential ☐ Multi-Unit Res. ☐ Industrial ☐ Commercial ☐ Institutional  
Number of Multi-Units: \_\_\_\_\_  
Owner Signature: \_\_\_\_\_

### Contractor Information (Required)

Name: \_\_\_\_\_ Email: \_\_\_\_\_  
Phone Number: ( ) \_\_\_\_\_ Fax Number: ( ) \_\_\_\_\_  
Contractor Signature: \_\_\_\_\_

### Proposed Work

Check or complete all that apply:

Service Connection Type: ☐ New ☐ Renewal ☐ Seasonal  
Service Connection System: ☐ Water ☐ Wastewater ☐ Stormwater  
Service Connection Location: ☐ Public ☐ Private  
Water Service Connection: Size: \_\_\_\_\_  
Wastewater Service Connection: Size: \_\_\_\_\_  
Stormwater Service Connection: Size: \_\_\_\_\_  
Lead Service Connection: ☐ Yes ☐ No ☐ Don't Know  
Backflow Prevention Device: ☐ Yes ☐ No ☐ Don't Know  
Pressure Reducing Valve: ☐ Yes ☐ No ☐ Don't Know  
Wastewater Septic Field: ☐ Yes ☐ No  
Driveway Culvert Installation: ☐ Yes ☐ No Size: \_\_\_\_\_

### For Office Use Only

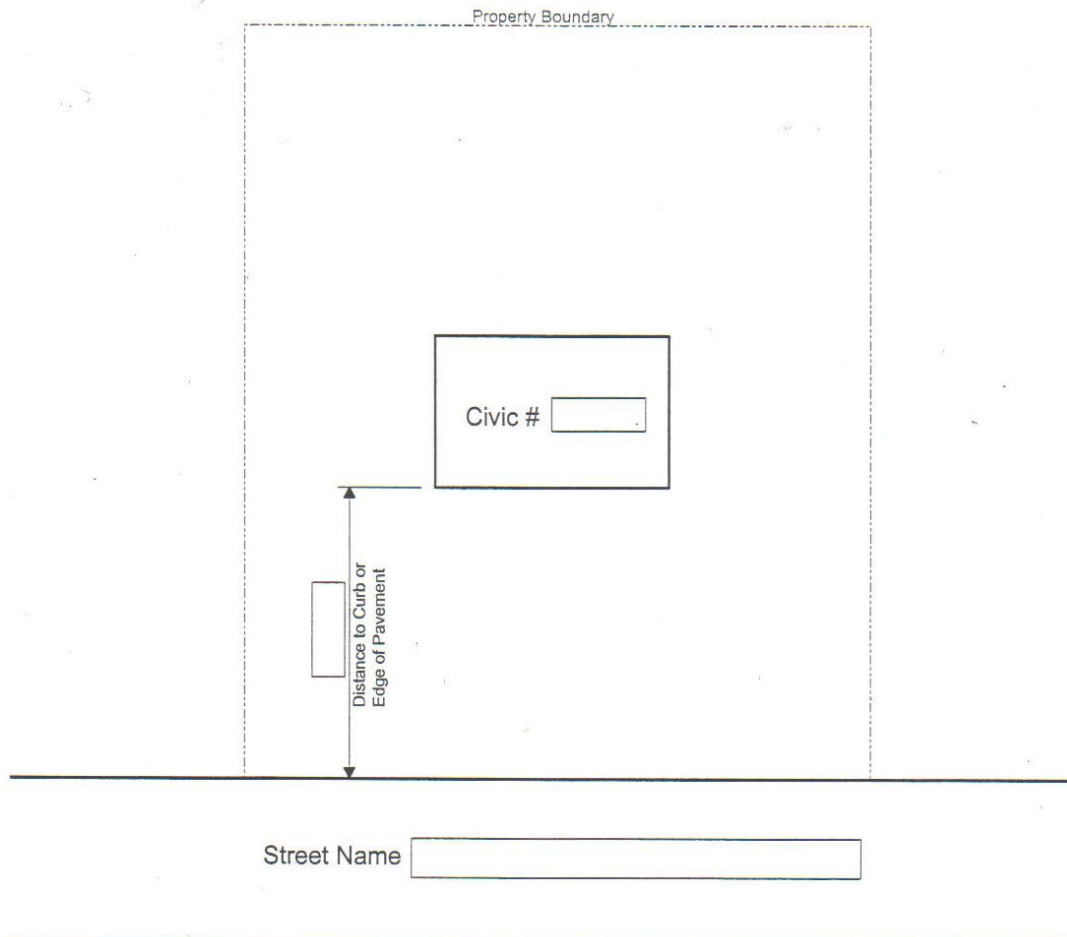
New Service & Renewal Application Number: \_\_\_\_\_  
Service Connection Inspection Fee: \_\_\_\_\_  
Water Service Connection Tapping Fee: \_\_\_\_\_  
Capital Cost Contribution Charge: \_\_\_\_\_  
Regional Development Charge (Water) \_\_\_\_\_  
Regional Development Charge (Wastewater) \_\_\_\_\_ Total Fees Due: \_\_\_\_\_

## NEW SERVICE & RENEWAL APPLICATION

### Application Sketch

In the space provided below, indicate all physical characteristics on, below or within the property that may impact they installation of the service connection installation or repair. Indicate if the proposed work is located on private property or within the Halifax Regional Municipality street right-of-way. If the work is located within the street right-of-way, the Applicant will be required to secure a Halifax Regional Municipality Streets and Services permit.

- Location of building(s)
- Location of garage(s)
- Location of driveway(s)
- Location of retaining walls
- Location of existing water service connection & service box
- Location of existing wastewater service connection (indicate gravity or pumped)
- Location of existing stormwater service connection
- Location of existing culvert(s)
- Location of existing wastewater septic field and distance to building
- Proposed location of service connection(s) to building
- Proposed driveway culvert(s)
- Location of underground gas, phone and electrical utilities
- Any other significant features



The diagram shows a rectangular property boundary. Inside the boundary, there is a rectangle representing a building, labeled "Civic # [ ]". To the left of the building, there is a vertical double-headed arrow labeled "Distance to Curb or Edge of Pavement" with a small rectangle next to it. Below the property boundary, there is a horizontal line representing the street, labeled "Street Name [ ]".

## WATER SERVICE CONNECTION, WATER METER & BACKFLOW PREVENTION DEVICE APPLICATION

### HALIFAX WATER

450 Cowie Hill Road, PO Box 8388, RPO CSC  
Halifax, Nova Scotia, B3K 5M1  
Phone: (902) 490-6918  
Fax: (902) 490-1584  
Email: EngineeringApprovals@HalifaxWater.ca

### Applicant, Customer & Premise Information

Date: \_\_\_\_\_ Building Permit Number: \_\_\_\_\_  
Name: \_\_\_\_\_ Email: \_\_\_\_\_  
Phone Number: ( ) \_\_\_\_\_ Fax Number: ( ) \_\_\_\_\_  
Location/Address: \_\_\_\_\_  
Property Identification Number (PID): \_\_\_\_\_ Lot Number: \_\_\_\_\_  
Premise Use: \_\_\_\_\_  
Type of Premise: ☐ Residential ☐ Multi-Unit Res. ☐ Industrial ☐ Commercial ☐ Institutional  
Degree of Hazard: ☐ Minor ☐ Moderate ☐ Severe Number of Multi-Units: \_\_\_\_\_

### Proposed Water Meter & Water Service Connection


Applicants are required to reference the *HRWC Water Meter & Backflow Prevention Device Design & Installation Manual* to size and design the water meter and backflow prevention device arrangement. Attach the **WATER METER SIZING CALCULATION SHEET FOR NON-FIRE SERVICE WATER METERS** to this application.

Water Meter Manufacturer: NEPTUNE Total Peak Demand: \_\_\_\_\_ usgpm  
Water Meter Model: \_\_\_\_\_ Water Service Connection Size: \_\_\_\_\_ mm  
Water Meter Size: \_\_\_\_\_  
Pressure Reducing Valve: ☐ Yes ☐ No

### Proposed Backflow Prevention Device

Backflow Prevention Device: \_\_\_\_\_ Bypass Arrangement Required: ☐ Yes ☐ No  
BFP Device Type: \_\_\_\_\_ Bypass BFP Device Type: \_\_\_\_\_  
BFP Device Manufacturer: \_\_\_\_\_ Bypass BFP Device Manufacturer: \_\_\_\_\_  
BFP Device Model: \_\_\_\_\_ Bypass BFP Device Model: \_\_\_\_\_  
BFP Device Size: \_\_\_\_\_ Bypass BFP Device Size: \_\_\_\_\_

### Water Service Connection, Water Meter & Backflow Prevention Device Sizing Certification

Designer: \_\_\_\_\_ Professional Engineer or Licensed Plumber (Print) \_\_\_\_\_ (Signature)  
Company: \_\_\_\_\_ Seal:   
Phone Number: ( ) \_\_\_\_\_  
Email: \_\_\_\_\_  
Comments: \_\_\_\_\_

## SPRINKLER SERVICE CONNECTION & BACKFLOW DEVICE APPLICATION

### Applicant, Customer & Premise Information

Date: \_\_\_\_\_ Building Permit Number: \_\_\_\_\_

Name: \_\_\_\_\_ Email: \_\_\_\_\_

Phone Number: ( ) \_\_\_\_\_ Fax Number: ( ) \_\_\_\_\_

Location/Address: \_\_\_\_\_

Property Identification Number (PID): \_\_\_\_\_ Lot Number: \_\_\_\_\_

Premise Use: \_\_\_\_\_

Type of Premise: ☐ Residential ☐ Multi-Unit Res. ☐ Industrial ☐ Commercial ☐ Institutional

Degree of Hazard: ☐ Minor ☐ Moderate ☐ Severe Number of Multi-Units: \_\_\_\_\_

### Proposed Sprinkler Service Connection

Type of Sprinkler: ☐ Dry ☐ Water Wet

☐ Gas Gas Type: \_\_\_\_\_

☐ Chemical Wet Chem. Type: \_\_\_\_\_

Fire Flow Demand Requirement: \_\_\_\_\_ usgpm

Sprinkler Service Connection Size: \_\_\_\_\_ mm

Fire Protection System:

☐ Class 1 ☐ Class 2 ☐ Class 3

☐ Class 4 ☐ Class 5 ☐ Class 6

Antifreeze Loops on Sprinkler System: ☐ Yes ☐ No

Fire Booster Pump Required: ☐ Yes ☐ No

### Proposed Backflow Prevention Device

Applicants are required to reference the *HRWC Water Meter & Backflow Prevention Device Design & Installation Manual* to size and design the backflow prevention device arrangement.

#### Backflow Prevention Device:

BFP Device Type: \_\_\_\_\_


BFP Device Manufacturer: \_\_\_\_\_

BFP Device Model: \_\_\_\_\_

BFP Device Size: \_\_\_\_\_

### Sprinkler Service Connection and Backflow Prevention Device Sizing Certification

Design Engineer: \_\_\_\_\_ Professional Engineer (Print) \_\_\_\_\_ (Signature)

Company: \_\_\_\_\_ Seal: 

Phone Number: ( ) \_\_\_\_\_

Email: \_\_\_\_\_

Comments: \_\_\_\_\_

## CHANGE OF WATER METER SIZE APPLICATION

### Applicant, Customer & Premise Information

Date: \_\_\_\_\_ Permit Number: \_\_\_\_\_  
Name: \_\_\_\_\_ Email: \_\_\_\_\_  
Phone Number: ( ) \_\_\_\_\_ Fax Number: ( ) \_\_\_\_\_  
Location/Address: \_\_\_\_\_  
Property Identification Number (PID): \_\_\_\_\_ Lot Number: \_\_\_\_\_  
Premise Use: \_\_\_\_\_  
Type of Premise: ☐ Residential ☐ Multi-Unit Res. ☐ Industrial ☐ Commercial ☐ Institutional  
Degree of Hazard: ☐ Minor ☐ Moderate ☐ Severe Number of Multi-Units: \_\_\_\_\_

### Existing Water Meter Arrangement Information


Water Meter Manufacturer: NEPTUNE Account Number: \_\_\_\_\_  
Water Meter Model: \_\_\_\_\_  
Water Meter Size: \_\_\_\_\_  
Pressure Reducing Valve: ☐ Yes ☐ No  
Backflow Prevention Device: ☐ Yes ☐ No  
Backflow Prevention Device Type: \_\_\_\_\_  
Backflow Prevention Device Manufacturer: \_\_\_\_\_  
Backflow Prevention Device Model: \_\_\_\_\_  
Backflow Prevention Device Size: \_\_\_\_\_

### Proposed Water Meter

Applicants are required to reference the *HRWC Water Meter & Backflow Prevention Device Design & Installation Manual* to size and design the water meter and backflow prevention device arrangement. Attach the **WATER METER SIZING CALCULATION SHEET FOR NON-FIRE SERVICE WATER METERS** to this application.

Water Meter Manufacturer: NEPTUNE Total Peak Demand: \_\_\_\_\_ usgpm  
Water Meter Model: \_\_\_\_\_ Water Service Connection Size: \_\_\_\_\_ mm  
Water Meter Size: \_\_\_\_\_

### Water Meter Sizing Certification

Designer: \_\_\_\_\_  
Professional Engineer or Licensed Plumber (Print) (Signature)  
Company: \_\_\_\_\_ Seal:   
Phone Number: ( ) \_\_\_\_\_  
Email: \_\_\_\_\_  
Comments: \_\_\_\_\_

## TEMPORARY WATER METER APPLICATION

### Applicant, Customer & Premise Information

Date: \_\_\_\_\_ Building Permit Number: \_\_\_\_\_  
Name: \_\_\_\_\_ Email: \_\_\_\_\_  
Phone Number: ( ) \_\_\_\_\_ Fax Number: ( ) \_\_\_\_\_  
Location/Address: \_\_\_\_\_  
Property Identification Number (PID): \_\_\_\_\_ Lot Number: \_\_\_\_\_  
Premise Use: \_\_\_\_\_  
Type of Premise: ☐ Residential ☐ Multi-Unit Res. ☐ Industrial ☐ Commercial ☐ Institutional  
Degree of Hazard: ☐ Minor ☐ Moderate ☐ Severe Number of Multi-Units: \_\_\_\_\_

### Temporary Water Meter Arrangement Information

The Applicant may be required to adjust the water meter arrangement to accommodate the temporary water meter. Requirements for a 5/8" temporary water meter are the same as the requirements for the permanent water meter, with the exception the Service Connection Record Drawings and the Engineer's Certificate of Compliance are submitted at building's substantial completion of construction. The following must be submitted and approved by HRWC:

1. Records of acceptable water service connection hydrostatic tests.
2. Records of acceptable bacteriological examination results.
3. Closed Circuit Television (CCTV) inspection and report.
4. Final inspection of the Water, Wastewater and Stormwater Service Connection(s) by HRWC.
5. New Service Connection cards.
6. Approval and inspection of the backflow prevention device(s) by Cross Connection Control Technologist.

Proposed Duration of the Temporary Water Meter: \_\_\_\_\_ From: \_\_\_\_\_ To: \_\_\_\_\_  
Temporary Water Meter Manufacturer: Neptune Temporary Water Meter Size: 5/8"  
Temporary Water Meter Model: T-10 Permanent Water Meter Size: \_\_\_\_\_  
Pressure Reducing Valve: ☐ Yes ☐ No  
Backflow Prevention Device: ☐ Yes ☐ No  
Temporary Backflow Prevention Device Type: \_\_\_\_\_  
Temporary Backflow Prevention Device Manufacturer: \_\_\_\_\_  
Temporary Backflow Prevention Device Model: \_\_\_\_\_  
Temporary Backflow Prevention Device Size: \_\_\_\_\_

Designer: \_\_\_\_\_  
Professional Engineer or Licensed Plumber (Print) (Signature)  
Company: \_\_\_\_\_ Phone Number: ( ) \_\_\_\_\_  
Email: \_\_\_\_\_

A temporary water meter is permitted for a **maximum of 6 months**. The Applicant is required to submit all outstanding Building Service Connection Acceptance Requirements at substantial completion of the building construction. Once approved, the premise owner is to schedule the permanent water meter installation. Changing the permanent meter size requires a *Change of Water Meter Size Application*. In new subdivisions, temporary meters will not be issued until the Primary Services have been accepted by Halifax Regional Municipality.



**BACKFLOW PREVENTION DEVICE  
TESTER'S LICENSE APPLICATION**

**Applicant Information**

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Email: \_\_\_\_\_

Phone Number: (\_\_\_\_) \_\_\_\_\_

Fax Number: (\_\_\_\_) \_\_\_\_\_

Occupation: \_\_\_\_\_

**Company Information**

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone Number: (\_\_\_\_) \_\_\_\_\_

City: \_\_\_\_\_

Postal Code: \_\_\_\_\_

☐ NEW – Provide the following when applying for the first time:

- Copy of *Cross Connection Control Tester Certificate* issued by the ACWWA
- Copy of *Plumber or Pipe/Sprinkler Fitter Certificate*
- Copy of *Certificate of Liability Insurance* for \$1,000,000 (minimum)
- *Cross Connection Control Accuracy Verification Report*
- License fee, \$50.00 cheque made payable to the Halifax Regional Water Commission

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

☐ RENEWAL – Provide the following when renewing a license:

- Existing license number: \_\_\_\_\_
- Expiry date of last license: \_\_\_\_\_
- Number of devices tested last year: RP \_\_\_\_\_ DCVA \_\_\_\_\_
- Provide a *Certificate of Liability Insurance* for \$1,000,000 (minimum)
- *Cross Connection Control Accuracy Verification Report*
- License fee, \$50.00 cheque made payable to the Halifax Regional Water Commission

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Office Use Only**

Testers License Number: \_\_\_\_\_

Date Issued: \_\_\_\_\_

Date Expires: \_\_\_\_\_

Licensed Approved By: \_\_\_\_\_

**CROSS CONNECTION CONTROL  
ACCURACY VERIFICATION REPORT**

**Applicant Information**

Date: \_\_\_\_\_

Name: \_\_\_\_\_ Email: \_\_\_\_\_

Phone Number: (     ) \_\_\_\_\_ Fax Number: (     ) \_\_\_\_\_

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ Postal Code: \_\_\_\_\_

**Testers**

Name: \_\_\_\_\_ Certification Number: \_\_\_\_\_

Name: \_\_\_\_\_ Certification Number: \_\_\_\_\_

Name: \_\_\_\_\_ Certification Number: \_\_\_\_\_

Name: \_\_\_\_\_ Certification Number: \_\_\_\_\_

**Differential Pressure Gauge**

Make: \_\_\_\_\_ Model: \_\_\_\_\_ Serial Number: \_\_\_\_\_

**Completed by Testing Agency**

1 psi/6.9 kPa	3 psi/13.8 kPa	7 psi/48.3 kPa	15 psi/103.4 kPa	Other

Gauge Increments: Major Graduations: \_\_\_\_\_ Minor Graduations: \_\_\_\_\_

Control Test Valves (Check Tightness): A \_\_\_\_\_ B \_\_\_\_\_ C \_\_\_\_\_

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Calibrate By: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_